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PREJEVALSKY'S EXPLORATIONS IN CENTRAL ASIA.

COLONEL PREJEVALSKY, known for his explorations in the Amur country and Mongolia and Tangut, has recently accomplished a third journey of still greater geographical importance (of which we have hitherto been able to give only brief particulars) across the Tian-Shan mountains to Lake Lob-Nor and the Altyn-Tag range southward of it. The report has now appeared, translated *in extenso*, as an extra number of Dr. Petermann's *Mittheilungen*, and we are enabled to give the substance thereof in these pages.

Colonel Prejevalsky, accompanied by two Cossacks who had been with him on his former journey in Mongolia, besides four others, and a Kirgiz, who could speak the Sart tongue, left Kuldja on the 12th August 1876. They had twenty-four camels and four horses, and were each armed with a Berdan rifle and two revolvers. Their way lay first up the valley of the Ili, which they crossed over to its left bank at the confluence of the Kash, where it is about 140 yards across, and has a swift stream. For 12 versts above Taranchi, villages are to be found on the right bank; but on the left bank there is no settled population. The Tekes stream, a tributary of the Ili, and rising in the vicinity of the Muzart pass, was crossed, and the party journeyed eastward through the valley of the Lower Kunges for some considerable distance (as far as 84° E. longitude of Greenwich), crossing the Zanma on their way. Up to this point the flora of the plain proved very poor, and the fauna not much richer; but beyond the confluence of the Zanma, though the height increased, the vegetation became richer. Black poplars, growing to a height of 80 feet occasionally met the eye; apple, birch, and apricot trees were more or less common. Here two Cossacks and the Kirgis interpreter proved unsuited for the journey, and were accordingly sent back to Kuldja to be replaced by others. The wealth of fruit-trees (apple and apricot) in the forests of the Kunges and other wooded ravines on the northern slope of the Tian-Shan is a characteristic feature in the vegetation; while, as regards the fauna, some fine specimens of a dark-brown bear were shot. The ornithology calls for no particular remark.

A moderately high range, with a pass of about 6000 feet high, divides the valley of the Kunges from that of the Zanma, the latter being 2000 feet above the level of the former. The Zanma valley is about 4 versts wide and overgrown with thick high grass, and its east end leads up to the foot of the Narat mountains, which with their western spurs form the northern edge of an extensive plateau called Yuldus in the heart of the Tian-Shan mountains. The pass over the Narat was 9800 feet high, and the ascent to it was not particularly steep though very fatiguing for camels. The Yuldus (*i.e.* star) consists of two parts, the Lesser Yuldus, which Prejevalsky and his companions followed for the whole of its extent along a steppe-plain 135 versts long and averaging 30 versts broad and 8000 feet above sea level, and the Greater Yuldus, which is traversed by the river of the same name which discharges its waters into Lake Bargratch-kul (the Bostan Nor of the maps and Tengis Nor of the Calmucks). Both in birds and in mammalia the Yuldus is very rich, and Prejevalsky mentions, amongst others, the following: gyps himalayensis, vultur monachus, ursus leuconyx and isabellinus, ovis poli, cervus maral, cervus pygargus, canis lupus and canis vulpes. The population, which eleven years ago inhabited the two Yulduses, have dispersed, since the Dungan uprising, part towards Ili and part towards Karashar. At the Yuldus, one of Prejevalsky's companions fell ill and had to return, but luckily the other one, Eklon, proved to be a most energetic young fellow. Here also the party remained three weeks and shot several large game, including two arkare or ovis poli, a noble animal which frequents the Yuldus in herds of thirty or forty. The Maral stag is also to be found in the Yuldus, as well as in the Tian-Shan forests, and attains large dimensions, its antlers fetching, in the case of a large pair, the high price of from 50 to 70 rubels first-hand. The ascent to the pass (9300 feet) is very gentle, and, beyond, the road leads along the ravine of the Balgantai-gol. The neighbouring mountains are scant of vegetation, the adjoining desert giving the side of the Tian-Shan a most lifeless aspect. Here also the rainfall, which is plentiful on the northern side, is wholly deficient, and this characteristic is probably common to the whole southern face of the eastern Tian-Shan. The height of the Chaidu-gol is only 3400 feet, and here a report was spread on the arrival of the Russians that a Russian army was approaching, which caused the panic-stricken Mussulmans to abandon their houses and flee to Karashar. At this point Tochta-achun, the guide, was sent back to Kuldja with the collections.

On the third day after their arrival in Charamoti, six Mussulmans appeared, sent by the Governor of Korla to ascertain the object of the Russians. The latter replied that they had permission from Yakub-

beg to visit Lob-Nor. This answer caused the natives to return to Korla, but they made their appearance again the following day, with a message that the Governor had applied for instructions to Yakub-beg, and, till receipt of a reply, the party could not be allowed to advance.

This gave the Russians the opportunity of making geographical and other researches about the vicinity of the Chaidu-gol, which stream, as well as the Bagarash (Bargratch) lake, is very rich in fish. This lake, which is not very far westward of Karashar, is said to be very deep, and eight or nine days' journey round.

At the end of seven days, permission was given them to proceed to Korla (65 versts), before entering which the last spurs of the Tian-Shan were passed. In Korla the Russians were provided with attendants, but these appeared to be charged with the sole duty of preventing any malcontents from approaching the strangers. In spite of fair words, all inquiries as to the town of Korla, its inhabitants, trade, character of the neighbourhood, received evasive or evidently untruthful replies; and this happened commonly in their sojourn in the country of the Badaulet, or "the fortunate one," as Yakub-beg is called. The inhabitants of the Tarim and Lob-Nor districts, however, the travellers found better disposed towards them, and, according to these, Korla has about 6000 inhabitants: it consists of two parts, surrounded with earth walls, inhabited by the merchants and soldiers respectively. At the time of the Russian visit the latter were few in number, as they had nearly all marched to Toksum, where Yakub-beg was building a fort to withstand the Chinese.

An individual named Saman-beg, a native of Trans-Caucasia and well acquainted with Russian, joined the party at Korla, in obedience to Yakub-beg's order. He was nominally a guide, but really a spy, though his suspicions were subsequently quieted. On the 4th of November the party started from Korla for Lob-Nor. The guide led them along unfrequented paths and across a loop of the Konche-daria—two crossings which turned out to be quite unnecessary. The route was first southward, for 86 miles, in the direction of the valley of the Tarim. The country is at first undulating, covered with flints and gravel, and quite destitute of vegetation. The southernmost spurs of the Tian-Shan are the Turuk-Tag range, which stretches south-east of Lake Bagarash, and finally loses itself in the desert. At the base of these hills is the same stony strip of country as that previously mentioned, and Colonel Prejevalsky is of opinion that it is the shore of a former sea. Beyond lies the Tarim and Lob-Nor desert, which consists of either barren salt-containing clay or shifting sand. It was the poorest and most desolate region Prejevalsky had ever set eyes on.

With regard to the hydrography of the region, he observes that the Konche-daria flows out of Lake Bagarash, breaks through the outer spurs of the Tian-Shan, and eventually joins the Kuk-ala-daria, an arm of the Tarim. The Inchike-daria, which loses itself in salt marshes, but when full probably reaches the Tarim, turned out, after much questioning, to be an arm of the Ugen-daria, which rises near the Muzart pass and eventually joins the Tarim. At the confluence the latter river is 50 or 60 fathoms wide and at least 20 feet deep. Its water is tolerably clear and the stream very swift. It reaches its most northerly point here, and then turns first south-west then south before it reaches the lakes Kara-buran and Lob-Nor. The natives call it by the name of Yarkend Tarim or Yarkend-daria, "tara" meaning an arable field, and this being in all probability a reference to the lands irrigated by the Yarkend river. East and west of the Tarim are salt marshes, from which the natives obtain fish and rushes, the only fodder for their cattle. Both the bed and the banks of the river are continually being raised by the masses of sand, dust and *dbéris* conveyed thither by the spring storms, and to make a breach in the bank and draw off a supply of water is hence an easy matter.

Westward a desert covered with sand-hills extends parallel with the Tarim, and north of the oases at the foot of the Kuen-Lun as far as the town of Keria. On the left bank of the Tarim the deserts are more unfrequent and not so extensive. The soil is a clay impregnated with salt, occasional tamarisk bushes and haloxylon are to be seen, and sand-hills similar to those in Ordos and Alashan.

In the immediate vicinity of the river the vegetation is somewhat richer. The *populus diversifolia* (?) is common, the halimodendron and asclepias cover a good deal of ground, but of meadows, grass, or flowers not a trace is to be seen. Of animal life Colonel Prejevalsky mentions fifteen mammalia, which include the royal tiger, lynx, wolf, fox, otter, maral deer, hare, wild boar, and the wild camel, the last three being very rare. Forty-eight specimens of birds were noted, two of which, the *Rhopophilus deserti* and the *Podoces tarimensis*, were new, though the last bore a great resemblance to the Podoces of Henderson. Only two fishes were observed, the schizothorax and another of the family cyprinidæ, both of which are common and form the chief food of the natives.

The inhabitants are divided into two administrative divisions: the Tarim or Karakul and the Lob-Nor or Kara-Kurtchin people. The present inhabitants of the Tarim valley (met with below the confluence of the Ugen-daria) lived originally about Lob-Nor, and about 100 years ago spread along the Tarim, owing to the diminution of fish and the raids of the Kalmucks. It is probable that they mingled by this means with previous inhabitants of the Tarim valley, perhaps fugitives or exiles from different parts of Eastern Turkestan, and this would account for the variety of types found among the Tarim people, who, however, undoubtedly belong to the Aryan stock. They are as a rule pale-faced with sunken chests and weak of frame: the men are of medium height and the women smaller. The difference between the Tarim, Taranchi and Sart tongues cannot be great, as the Taranchi interpreter from Kuldja could make himself understood easily. Their religion is that of Islam. Their dwellings are rude structures made of poplar trunks and canes or reeds. A dozen or so of these houses form a village, but these are not occupied for long, as the inhabitants change their locality when in want of fuel or fodder, and also on an attack of small pox, which usually occasions great ravages. The number of inhabitants amounts in all to about 1200.

One day's journey from the mouth of the Ugen-daria lies the village of Achtarma, the latitude and longitude of which were determined by Prejevalsky.

From thence the way lay along the course of the Tarim, which is fringed by a strip on either hand running parallel to the river, and covered with trees, reeds, and marshes. After proceeding for a distance of 190 versts along the Tarim, they reached the confluence of the Kuk-ala-daria and the Tarim, where the latter assumes a breadth of from 30 to 35 fathoms, which it maintains up to its mouth in the Kara-buran lake. At a distance of 15 versts from the lake the party diverged southward to the village of Charchalyk, built about thirty years ago by outlaws from Khotan, of which there are at present 114 engaged in tilling fields for the State, the water being derived from the Charchalyk-daria, which rises in the lofty range called Altyn-Tag, south of Lob-Nor.

Three hundred versts, or eleven days' journey for a pack-ass, south-west of Charchalyk, is the little town of Cherchen, on the Cherchen-daria, under the same ruler as Charchalyk. South-west of Cherchen is the oasis of Nai, at a distance of ten days' journey, beyond which lies Keria, containing about 3000 houses, Chira, and Khotan; the latter, as well as Cherchen and Keria, being under the rule of Yakub-beg. One day's journey from Keria, gold is found in the mountains, and also five days' march from Cherchen, near the sources of the Cherchen-daria. The yearly yield is about 60 puds, which all goes to Yakub-beg's treasury. Where Charchalyk now stands, and also at the distance of two days' journey from it, are the ruins of two towns, called Ottogush-shari (from Ottogush, a former ruler) and Gas-shari respectively. Close to Lob-Nor are the ruins of a third and pretty extensive town called Kune-shari.

From inquiries, Prejevalsky ascertained that about 1861 or 1862 a colony of Russians, numbering about 160 or 170 people, including women and children, with their pack-horses, and armed with flint-lock muskets, settled on the Lower Tarim and at Charchalyk, but that they made no long stay, and soon returned to Urumchi, *vid* Turfan.

After a week's rest in Charchalyk, the Colonel left the greater part of his baggage with three of the Cossacks, while he and Eklon started at Christmas for the Altyn-Tag mountains in quest of wild camels. They took with them eleven camels and one horse, a felt tent, and provisions for a month and a half, their guides being two of the best hunters about Lob-Nor.

The Altyn-Tag range is visible from Airylgan, a distance of 150 versts, and from Charchalyk appears as an enormous wall rising above the limits of perpetual snow to the south-west. Prejevalsky and his companion explored the northern face of this chain, which forms the edge of a lofty plateau, for a distance of 300 versts eastward of Charchalyk. Without doubt it forms the northern escarpment of the Tibetan plateau, as the natives say that it extends south-westward without a break to Keria and Khotan, and eastward beyond their knowledge. On the desert side the Altyn-Tag sends out spurs, with valleys between, ranging up to 10 versts long and 4 or 5 in breadth, and sometimes as much as 11,000 feet above sea level, while the summits of the mountains rise about 2000 or 3000 feet above. The summits of the main axis of the range no doubt attain this height, though the drop on to the plateau on the southern side is much slighter. Although the Russians did not explore the southern side, they learned from their guides, who had often hunted there, that in following the old road to Tibet, used by the Kalmucks before the Dungan insurrection, one crossed first a plateau 50 versts wide and about 13,000 feet high. Next came a range about 20 versts across, bearing no particular name, and then a plain 40 versts wide, beyond which an enormous mountain chain, crowned with perpetual snow, called the Chamen-Tag, rises. Westward these three ranges unite into one, which reaches the limit of perpetual snow near Cherchen, and is called Tugus-daban. The outer edge of the Altyn-Tag consists mainly of sandstone and limestone, while at the higher altitude is to be seen porphyry and, more rarely, granite. Water is scarce, and what springs there are have a brackish taste. These mountains are characterised by great sterility, and it is only in the valleys and ravines that vegetation grows; yet, nevertheless, large swarms of locusts are here to be seen. In the summer of 1876 they committed great ravages, and rose to a height of 9000 feet in the mountains. The fauna of the northern slope of the Altyn-Tag is not rich, only fifteen species being heard of by Prejevalsky, ten of which are not to be found in the Tamir valley and around Lob-Nor. Three of the first-named category—Pseudois Nahoor, Poëphagus grunniens, and Antilope Hodgsoni—are peculiar to Tibet, and reach their northern limit here. There were eighteen kinds of birds found by Prejevalsky. The climate of the Altyn-Tag is characterised, on its northern side at least, by great cold and little snow. In summer, according to the natives, it rains frequently and is very windy.

With the exception of paths for hunting there are only two roads in these mountains, one to Sha-chow and the other to Tibet, but since the Dungan uprising both have been abandoned. From the 26th December to the 5th February one wild camel only was seen by Colonel Prejevalsky, and this one he unfortunately missed at 500 yards.

During his sojourn in the Altyn-Tag he experienced great discomfort from the scarcity of animal food and the want of water. At Chaglyk observations for latitude and longitude were taken while the hunters returned into the mountains to look out for wild camels, a skin of which Prejevalsky was very desirous of securing. The native reports were unanimous in declaring the Kum-Tag desert to be the most likely place for these animals. Twenty years ago they were said to have been very common, and the guide affirmed he had seen herds of dozens and even of upwards of a hundred together, but that with the increase of the population of Charchalyk and of hunters they had much diminished. A skin is now worth at Lob-Nor ten *tenge*, or about 1 rouble 30 kopeks (4s. 2d.) The animals seek the upper valleys of the Altyn-Tag in the summer and the most inaccessible deserts in the winter. Their sight, sense of hearing and of smell are exceedingly quick, a striking contrast to the domesticated camel, which is just the opposite.

The hunters despatched by Prejevalsky returned on the 10th March to Lob-Nor with the skins of a male, female, and a young one, to which was added the skin of a fourth, shot on the lower Tarim. This one, however, had been bred in a warmer district, and had already begun to shed its hair. With regard to their origin, Colonel Prejevalsky argues at some length that the preponderance of evidence is in favour of their

being of wild stock, the descendants of which, however, have mingled with tame camels.

Turning to the Lob-Nor lake, which the travellers reached in the early days of February, it should be observed that the Tarim discharges itself first into a smaller lake (from 30 to 35 versts in length and between 10 and 12 versts in breadth) called Kara-buran (*i.e.* "black storms") into which the Cherchen-daria flows as well. A great part of the Kara-buran, as well as of Lob-Nor, is overgrown with reeds, the river flowing in its bed in the centre. The name Lob-Nor is applied by the natives to the whole lower course of the Tarim, the larger lake being called Chok-kul or Kara-kochun. This lake, or rather morass, is in the shape of an irregular ellipse running south-west and north-east. Its major axis is about 90 or 100 versts in length, its minor axis not more than 20 versts. This information is derived from the natives, as Prejevalsky himself explored only the southern and western end and proceeded by boat down the river for about half the length of the lake, further progress being rendered impossible by the increasing shallowness of the water and the masses of reeds in every direction. The water itself is clear and sweet, though there are salt marshes all round the lake, and beyond them a strip of ground parallel with the present borders of the lake and overgrown with tamarisks. It is probable that this strip was formerly the periphery of the lake, and this conclusion is corroborated by the natives, who say that thirty years ago the lake was deeper.

At the western end of the lake the Tarim is 125 feet broad and 14 feet deep in its deepest place at medium height, but it soon diminishes in size and depth, and finally loses itself in swamps in the north-east, the reeds, which are 18 feet high occasionally and 1 inch in thickness, preventing any further exploration.

The inhabitants about Lob-Nor, called Kara-kurchins, occupy eleven villages, and number about 300 in all. Their language, as they say, is most akin to that of Khotan. Their habits, appearance, dwellings, and mode of life are described at considerable length.

The flights of birds of passage which make a resting-place of Lob-Nor in their migrations, were very carefully observed by Prejevalsky; and during the fortnight succeeding the 8th of February millions passed on their way across the desert. None of these come from the south across the lofty and cold plateau of Tibet; but they cross it where it is narrowest, *i.e.* in the direction of Khotan.

On their return journey, at Korla, the Russians had an audience of Yakub-beg, who appears to have received them kindly, though Prejevalsky expresses his indignation at having been asked for a certificate to the effect that he had been hospitably and well treated during his journey in Yakub-beg's territories. The party re-entered Kuldja at the beginning of July, having been most fortunate, as Colonel Prejevalsky remarks, in achieving the exploration during the brief period following on Yakub-beg's annexation of that portion of the country and its invasion and conquest by the Chinese.

HIMALAYAN EXPLORATIONS.*

DURING the year 1876, the Mullah, one of the explorers of the Great Trigonometrical Survey of India, made a survey up the course of the Indus, from the point where it enters the plains above Attok, to the point where it is joined by the river of Gilghit. All other portions of the course of the Indus—from the table-lands of Tibet, where it takes its rise, down to its junction with the ocean—have long since been surveyed; but up to the present time this portion has remained unexplored, and has been shown on our maps by a dotted line, the usual symbol for geographical vagueness and uncertainty. Here the great river traverses a distance of some 220 miles, descending from a height of about 5000 feet to that of 1200 feet above the level of the sea. Its way winds tortuously through great mountain ranges whose peaks are rarely less than 15,000 feet in height, and culminate in the Nanga Parbat, the well-known mountain, whose height, 26,620 feet, is only exceeded by a very few of the great peaks of the Himalayas. The river in many places is hemmed in so closely by these great ranges that its valley is but a deep-cut, narrow gorge, and, as a rule, there is more of open space and culturable land in the lateral valleys, nestling between the spurs of the surrounding ranges, than in the principal valley itself.

The positions and heights of all the most commanding peaks in this region had been long fixed by Captain Carter's observations at trigonometrical stations on the British frontier line; but no European has ever yet penetrated into it.† Very difficult of access from all quarters, it is inhabited by a number of hill tribes, each independent and suspicious of the other, who are in a great measure separated and protected from each other by natural barriers and fastnesses. As a whole, the region has never been brought into subjection by any of the surrounding powers. Each community elects its own ruler, and has little intercourse with its neighbours; and with the outer world it only communicates through the medium of a few individuals who have the privilege of travelling over the country as traders. The Mullah possesses this privilege, and thus, in the double capacity of trader and explorer, he traversed along the Indus, and through some of the lateral valleys, leaving the others for exploration hereafter.

This work done, he proceeded, in accordance with his instructions, to Yassin, marching through the Gilghit valley, but not surveying it, because the labours of the lamented Hayward, who was murdered at Yassin, already furnished us with a good map of that region. From Yassin he surveyed the southern route to Mastuj through the Ghizar and Sar Laspur valleys; this has furnished an important rectification of a route which had hitherto been laid down from conjecture only, and very erroneously; for the road, instead of proceeding in a tolerably straight direction from Yassin to Mastuj, as was supposed, turns sud-

* From the *General Report on the Operations of the Great Trigonometrical Survey of India during* 1876-77. By Col. J. T. Walker, C.B., Surveyor-General of India, &c.

† Several itineraries which were obtained from native information are published in Dr. Leitner's *Dardistan*, and they have been combined together, with considerable ingenuity and very tolerable success, by Mr. Ravenstein, in a map published in the *Geographical Magazine* for August 1875.—J. T. W.

denly from south-west to north-north-east at Sar Laspur, which is situated at some distance to the south of the direct line, in a valley lying parallel to the valley of Chitral. At Mastuj the Mullah struck on to his survey of the route from Jelalabad, *viâ* Dir and Chitral, to Sarhadd-i-Wakhan in 1873, and then proceeded along that route towards the Baroghil pass, as far as the junction of the Gazan, with the Yarkhun river, and then along the northern road from Mastuj to Yassin. This road turns up the Gazan valley, crosses the Tui or Moshabar pass—which is conjectured to be probably not less than 16,000 feet in height—and, after traversing a deep crevassed glacier for a distance of about eight miles, reaches the point where the Tui river issues in great volume from the glacier; the road then follows the course of the river down to its junction with the Warchagam river, a few miles above Yassin.

Returning to Sar Laspur, the Mullah next surveyed the route to the south-west, up the valley leading to the Tal pass. This pass is situated on a plateau of the range which connects the mountains on the western boundary of the valley of the Indus with those on the eastern boundary of the valley of Chitral, and is generally known by the people of the country as the Kohistan. The sources and most of the principal affluents of the Swat and the Panjkora rivers take their rise in this region, all the most commanding peaks of which were fixed by Captain Carter's triangulation; but of the general lie of the valleys relatively to the peaks, nothing at all definite has been known hitherto. The Mullah has done much to elucidate the geography of this region. On crossing the Tal plateau he descended into the Panjkora valley, and traversed its entire length down to Dodbah, at the junction of the Dir river with the Panjkora, where he again struck on his route survey of 1873.

It would have been well if he could then have gone down the Panjkora to its junction with the Swat river, but circumstances prevented him from doing so. He therefore travelled along the Havildar's route of 1868 as far as Miankalai, and then surveyed the road to Nawagai and on to Pashat in the valley of Kunar; and, finally, returning to Nawagai, he surveyed the road from there down to the British fort of Abazai.

Thus the explorations of the Mullah have added much to our knowledge of the geography of the interesting regions lying beyond our northern Trans-Indus frontier. A good deal, however, still remains to be done before our knowledge of these regions is as full and complete as it should be, and every effort will be made to carry out further explorations as soon as possible.

The accompanying sketch map has been constructed to illustrate the Mullah's operations; it also shows the localities where more information is wanted. In the north-east corner the results of a recent reconnaissance of portions of the Karambar and the Nagar valleys by Captain Biddulph are given, but somewhat modified from his map of the country.

THE COSSACKS.

OF late years the labours of a certain school of historical inquirers have been frequently employed in the "rehabilitation" of those characters which, by the pretty general consent of the writers of every period, have been consistently blackened for ages. Now that King John—the "trifler and coward" of Macaulay—has been made out by a recent historian to have possessed an unusual share of boldness and astuteness, and to have been led into an antagonism with his barons and people by the consciousness of political virtues, of which he had a larger share than fell to the lot of even the more illustrious Plantagenets, the work of historical "white-washing" will probably cease from the want of objects to which to devote it. One consequence of the Russo-Turkish war has been the discovery of virtues, hitherto unperceived or denied, amongst several of the minor races or communities of South-eastern Europe. The Roumanians are no longer to be regarded as a soft and effeminate people, careless of all political questions save those involved in the pursuit of place, and with an *insouciant* indifference to military glory. The Montenegrins are not only gallant warriors and hardy mountaineers, they are the professors of enlightened opinions upon self-government, and more than ordinarily alive to the benefits to be derived from extended primary education. The recently-discovered virtues of the Bulgarians have been made almost a *casus belli* between different sets of writers and observers, and their unhappy race has been the object of wordy contentions almost as fierce as the terrible physical struggles which for so many months have desolated their unfortunate country. There is one community, however, with which each of the above have often been brought in contact, whose bad name has, if possible, been made rather worse of late. That community is known by the name of "The Cossacks." The remarks of some very recent observers may be construed as almost denying them the possession of the one virtue which has scarcely ever been questioned before—the military virtue of courage. It is true, indeed, that Mr. Laurence Oliphant, who travelled amongst them just before the Crimean war, spoke of their valour in action as one of those fictions which the Russian Government found it convenient to keep up. But he spoke, not after personal observation of their conduct in war, but—as he informs us—upon Russian authority, and of the Don Cossacks more particularly, whom other families of Cossacks are accustomed to look down upon and disparage.

The prevalent idea in Western Europe of a Cossack is of a half-barbarian plunderer—a kind of wild horseman but half reclaimed by the stern military discipline of the Czars from the savagery of the nomad state. Even a special correspondent of one of the London newspapers with the Russian armies in Bulgaria has represented the Cossacks—on Russian authority, be it noted—as little better than a set of mere plundering freebooters. The terrors of a Muscovite invasion owe much of their intensity to the dread which the character of ruthless marauders, given to these auxiliaries, always inspires. An incursion of the Turcos was not more feared in Germany in 1870 than would be a Cossack inroad by any Western nation now. Phrases which have become

almost proverbial support the feeling with which the Cossack is regarded. In his spitefully epigrammatic prophecy of the fate of Europe, Napoleon, who could hardly have been expected to look very kindly upon the species, declared that in fifty years it would be either Republican or Cossack. The whole point of the antithesis lies in the belief that "Cossacks" are the very antipodes of "republicans." Amongst seamen the most opprobrious intensification of the disparaging term "land-lubber" is Cossack, preceded, of course, by a suitable procession of adjectives. The decline of Cossack military virtue is attributed, in a recent discussion of the armed strength of Russia, to the civilisation which of late years is supposed to have overtaken that hitherto semi-savage people.

Surprising as it may seem, the unvarying testimony of travellers and inquirers who have visited their homes and consulted native authorities has, for many generations, uniformly represented the Cossacks as exactly the opposite of what we so persistently believe them to be. Perhaps there are few matters upon which travellers have been so frequently in agreement, and even fewer on which their unanimity has had so little effect in the direction of removing prejudices and preconceptions. It is not putting it at all too strongly to say that all visitors to Cossack abodes represent them as having long been a highly-civilised and cultured people, living under a Government of an almost ideally perfect democratic form, and having at several periods of their history exhibited an amount of maritime enterprise and daring not much inferior to that of the early Scandinavian pirates whose deeds at sea are so universally celebrated. If we examine the reports made after personal observation by visitors of our own and other foreign nations during the last and the present centuries, we shall see how unjust is the reputation which the Cossacks have acquired, and how distinctly it can be traced to the malevolent invention of their ungrateful Muscovite fellow-subjects.

In speaking of the Cossacks it is not easy to use a satisfactory collective appellation. They are not, strictly speaking, a race, a people, or a community. Ethnologically they spring from a mixture of races; politically they are subjects of the Russian Czars, whose language they speak, and they consist, not of one, but of several distinct communities. Every one has heard of the Don Cossacks, the Orenburg Cossacks, the Cossacks of the Ukraine, &c., the prefix always indicating some special, and often altogether independent, division. These divisions are sometimes as ethnically distinct as the territories they occupy are geographically remote, allowance being made for the predominant Slavonic element present in all instances. The origin of the Cossacks has been a matter of some discussion. Klaproth held that it had "been by no means satisfactorily solved." And though most writers now agree in the account they give of it, their agreement to a great extent results in what is in effect a begging of the question. A recent German writer, von Drygalski, has had the courage to admit that, "whence they came, and how in general the name Cossack arose, no historian has yet been able convincingly to explain." The various explanations and derivations of their name would go a long way towards making up, by themselves, a treatise on etymology. The historian Karamsin understands the word "Cossack" as meaning a volunteer or free partisan. Klaproth refused to admit that it could be derived from the Turco-Tartar word *Ckazack*, signifying a robber, or even from a synonym meaning a sledge. "Some say it is a Tartar word," writes Clarke, the learned traveller of the beginning of this century, whom many subsequent visitors to Russia have copied without troubling themselves to acknowledge it, "Some say it is a Tartar word meaning an armed man; others, a rover; others, that the Poles called them Cossacks from a word in their language signifying goat." This he stigmatises as a "wild pursuit of etymology;" an opinion in which most people will be disposed to agree with him. Mr. Oliphant, who believes the Don Cossacks to be "the most compound beings in the universe," says that he has met with derivations of their name "from words in other languages which signify respectively an armed man, a sabre, a rover, a goat, a promontory, a coat, a cassock, and a district in Circassia." The most recent attempt to settle its etymology has been made by a German writer, who tells us that—"It is known that in Western Asia there exists an extraordinarily-numerous and wide-spread nomad people of Tartar origin, the so-called Kirgis-Kaisaks, who in reality distinguish themselves from the Kirgis proper, or Kara-Kirgis, and for a century have given themselves the name of Cossacks—in German, *vagabund*." This word, it is probable, has found its way from Asia into Europe, and is used to denote people of similar habits to the Kirgis tribe above mentioned. Grekov, a Russian, declares for this hypothesis, and observes that in Russia it was customary to designate homeless wanderers by the same term.

The progress of philology will probably sooner or later settle this etymological puzzle; but the question of the origin of the people by whom the name is borne will not prove quite so easy of solution. Clarke says that the Cossacks have been known as a distinct people for nearly a thousand years. Constantine Porphyrogenitus had written—"Beyond the Papagian country is the country called *Casackia*, but beyond the *Cossacks* are the summits of the Caucasus." Jonas Hanway, who travelled in the reign of George II., regarded them as "a species of Tartars." Clarke opposes to this the view of the German Storch, who insisted that they were of Russian origin; and his own opinion is that they were a "mixture of various nations, principally Circassians, Malo-Russians, and Russians, but also of Tartars, Poles, Greeks, Turks, Calmucks, and Armenians." Klaproth believed that the Cossacks of Little-Russia, whose history could be traced back only to 1340, were the most ancient. After the reduction of Red Russia by the Poles, he says, it is "probable that many Russians emigrated from that country to seek an asylum lower down the Dnieper, where they intermingled with the Tartars and Tscherkessians." The invasion of Russia by the Tartars in the fifteenth century, and the fall of Kiev, increased the number of these refugees. In blending with the other races, the Cossacks of Russian origin, being the more numerous, retained, and imposed upon the others, their language and religion. This view is corroborated by the statement of another writer, that Russian is the groundwork of their dialect: "in military matters there is an infusion of Turkish

words," the speech of their earliest enemies; "in legal, of Polish," that of their early rulers.

The Circassian element in the composition of the Cossacks must have been of importance, though not equal in degree to that of the Russian. Chazackia, or Cazackia, we learn from Clarke, is a part of Circassia; and from another authority, that the Cossacks "were long known by the appellation of Tscherkassi, and to this day they call their capital Tscherkask." Their early history is as fragmentary as their real origin seems to be obscure. The first mention of them represents them as taking an important part in the proceedings of the peoples of South-eastern Europe. There is little doubt that they existed as a sufficiently organised body to make their presence felt wherever they presented themselves some centuries before the time usually assigned to their first appearance. Before the middle of the tenth century they had already been heard of on the frontiers of Poland as it then was. Their numbers received a considerable accession in the many Polish wanderers who came amongst them. Their first notable armament was in the year 948, "when the Greek Emperor employed them in his war against the Turks." For their services on this occasion, we have the authority of Clarke that he sent them "recommendatory letters to the Polish Sovereign, requesting that in future their appellation might be Cossacks."

The term was probably applied in subsequent times to people whose mode of life resembled that of the original Cossacks, though there was between them no other connection. Mr. Mackenzie Wallace tells us that to protect the agricultural population of the steppe upon their borders from the annoyances of their nomad neighbours, the Kings of Poland and the Czars of Muscovy built forts and palisades, and kept up a regular military cordon. "The troops composing this cordon were called Cossacks, but they were not the Cossacks best known to history and romance." These, the Free Cossacks, lived beyond the frontiers. "Though," says Mr. Wallace, "Russian by origin, language, and sympathy, the habit of kidnapping Tartar women introduced among them a certain admixture of Tartar blood." Originally they might have been divided into two distinct divisions, of which one looked to the Czars of Muscovy as in some respect their superiors, and the others to the Kings of Poland. Migrations, revolts, the extension of the Russian Empire, and other causes, have ended in making the Czar alone the Lord Paramount of all the Cossack communities.

Sir Archibald Alison, whose literary touch is not often of the lightest, has drawn a somewhat fanciful parallel between the origin of these strange people and that of the Venetians. The rise of the "Cossack nation" he fixes in the midst of the misery and devastation caused by the Tartar inroads, which lasted for two centuries. Crowds of fugitives fled before the invading hordes. "Two corners of land, overlooked in the great streams of conquest to the south-west, remained as places of refuge—one beyond the Don towards the Sea of Azov, and the other beyond the islands of the Dnieper towards the Black Sea. They formed the cradle of this singular people." On these islands of the Dnieper, as on the islands of the Adriatic, arose a free and powerful community. At the time of the first general invasion of the Tartars, and again during the Lithuanian wars, many fled to them for shelter; and there flowed in also adventurers guided by necessity or the love of change, deserters from Poland, Lithuania, Hungary, and Wallachia, fugitives from Tartar bondage, and serfs flying from their Muscovite masters.

So many authorities place the origin of the Cossack people at or near the period of the Tartar domination in Russia, in spite of the evidence in favour of its greater antiquity, that we may accept their statements as proof of the date they assign being really that when the Cossacks came to be regarded as a power in South-eastern Europe and on the confines of Asia. The destruction of Kiev, in 1415, undoubtedly added enormously to the strength of the Cossacks of the Ukraine, and enabled them to make head against the Tartar oppressors of the different parts of Russia. About the time that the Tartar dominion was overthrown the number of refugees from its oppression had been so great that the country from the Bug to the Dniester became comparatively populous, and on it many towns and villages were built. Of these the inhabitants all claimed to be Cossacks, and waged almost continuous wars with the Tartars and the Turks. Their appearance as a powerful military confederacy was so unexpected that they seemed to be a new people, who had suddenly sprung up on the wide steppe, just deserted by the Tartars, which separated the Muscovite territory towards the Black Sea from the Empire of the Sultans of Stamboul. Krassnov, himself a Cossack, asserts that—"It was not known whence they came; but speech, religion, and, still more, inviolable attachment and devotion to the Czars, disclose a Russian origin." Still, perceptible signs and inveterate habits prove the "long previous existence" of this confederacy.

It was not only fugitives from Tartar despotism, and inhabitants of disorganised countries from which their conquerors had just been driven, that swelled the ranks of the community. Many who had experienced the republican freedom of the free state of Novgorod fled before the sharp discipline of the Muscovite Czars to the steppes of Southern Russia. Thus a democratic spirit and a knowledge of democratic institutions, which became so marked a feature of the Cossack polity, allied themselves to the warlike and adventurous genius of the earlier members of the body. The genuine "Free Cossack," as we learn from Mr. Mackenzie Wallace, lived beyond the frontiers of Muscovy, or Russia, or Poland, and there formed "self-governing communities." Every river flowing towards the south was held by some Free Cossack confederacy, which permitted neither Christian nor Tartar to pass through its territory without its leave. Officially, they were Russians by race, Christians by religion, and—except the Cossacks of the Dnieper, who owned the sway of the Kings of Poland—loyal subjects of the Czars. In effect, they were anything but the last. They obeyed the mandates of the Czar, and were acknowledged by him as his subjects, whenever it was convenient to both parties. If disobedience were more pleasing to them, they readily disclaimed their allegiance; and, on the other hand, if they had proved unduly troublesome to neighbours with whom Muscovy was at peace, they were unhesitatingly disavowed.

South of Russia (before the empire reached the

Euxine and the former dominions of Poland) extended a wide tract of country in the neighbourhood of the Dnieper known as the Ukraine, a word which—as Jonas Hanway wrote a hundred and twenty-five years ago—signifies frontier. This was the chosen home of many Cossack confederacies. An important branch was known by the name of Zaporoghes or Zaporovians. They established their *setcha* or capital on an island on the Dnieper, the Korlitz-koi-Ostrof. The married people lived in villages on the steppe and the river-banks, and the single in their fortified head-quarters on the island of Karlitzkoi. Mr. Wallace's description of their mode of life is very interesting. The *setcha* contained thirty-eight enormous wooden sheds or barracks, in each of which lived a troop of Cossacks, some 600 strong, called a *kurén*. These buildings must have borne a considerable resemblance to the extensive timber structures which surrounded the courtyard of a Japanese Daimio's *yashiki*, and which housed his numerous retainers. Each *kurén* assembled at common meals—a reminder of the συσσίτια of the ancient Spartans. No woman was admitted within the enclosure of the citadel. The members of this military brotherhood called themselves *Lytsars*—a corruption of the German *Ritter*, or knight, in acknowledgment of the similarity of their mode of life to that of some of the ecclesiastico-military fraternities of the Middle Ages. All offices were elective, and the period of incumbency was a year. The head of a *kurén* was chosen by his fellows, and any member was eligible to the post; any head of a *kurén* might be elected Attaman (Hetman).

Cossacks of all branches were ready to turn their arms against any power with whom they had a quarrel, even against that to which they professed allegiance. At one time they were in the habit of furnishing troops to the Voivodes established in the Ukraine by the Lithuanian princes. The expenses of these troops they bore themselves, to be recouped, it should be understood, for their outlay by the plunder of the enemy's country. In the sixteenth century the Muscovites seem to have strengthened their hold on some important branches of the great Cossack confederacy. In 1579 they made their appearance for the first time in the Russian armies. In 1580, those who served the Polish kings were first divided into *pulks*, or regiments, whilst defending Tshegrin against the Tartars. A few years later, King Stephen divided them into ten regiments of infantry and a body of horse numbered at 2000. The sovereigns of Poland requited their services by what they considered encroachments on their rights. These gave rise to a long series of contentions, and in the end they sought the protection of Russia, to which they transferred their allegiance in the middle of the seventeenth century. They remained faithful to their new masters until the period of the invasion of Russia by Charles XII., when they offered their services to that monarch. It is with this branch of the Cossack family that the romantic fable of Mazeppa is connected. Peter the Great disbanded and remodelled the Cossack regiments. Their spirit of freedom was again outraged by the harsh measures of the Russian ruler, and they went over to the Khan of the Crimea. They soon became disgusted with their new masters, and succeeded in obtaining pardon from the Empress Anne, who allowed them to settle again on Russian territory. Fresh cases of turbulence provoked the Empress Catherine to destroy their *setcha*, and to form the Ukraine Cossacks into regiments of Hussars. The bulk of the Zaporoghes were banished to the peninsula of Taman. Count Razumoffski, the last Attaman of the Ukraine, was dismissed by Catherine II. In her reign their organisation may be said to have come to an end, though the Emperor Nicholas re-established certain Ukraine regiments under a different name.

The most important of all the branches is undoubtedly the Cossacks of the Don. They may be taken, says Drygalski, "as denoting the primary type" of the whole body of Cossacks. Alison estimated the extent of their territory as being equal to nearly two-thirds of that of the British Islands, and it is "incomparably more level and fertile." The beginning of their historical existence as an organised community may date from the reign of Ivan the Terrible. He issued a ukase, which is considered as constituting the first title-deed to the territory which they held on the River Don and the neighbouring streams. This ordered them, in return for the possession of the specified territory, to engage in an "unending pursuit of the Tartars, the former oppressors of their country and enemies of the Christian faith." Fighting was, almost of a necessity, the chief business of their lives; and in old times, according to Mr. Wallace, the Don Cossacks prohibited agriculture on pain of death: possibly more on account of the temptation that fertile and cultivated districts offered to the raiding nomads of the neighbourhood, than because of any enervating effect attributed to it.

The Don Cossacks, since they have been of any historical importance, at all events, were always supposed to be subject to the Czars. They have, however, been rather disobedient dependents, and have twice raised formidable insurrections; the last in 1773. The origin of the Siberian Cossacks is attributed to the restlessness of a portion of the Don Cossacks under the pressure of Muscovite rule. A large body of them, between six and seven thousand in number, under the leadership of their Attaman, Yermak Timovief, began to move towards the East during the latter half of the sixteenth century. They are said to have reached first the Government of Perm, and whilst halting there discovered the country now known as Siberia. In their desire to move farther away from their Muscovite oppressors they thought of penetrating to this newly-found territory, but the wide deserts, as seen from the elevation of the Ural mountains, intimidated them, and they professed an intention of remaining where they had already arrived. Yermak, by his eloquence, persuaded them to go on. They passed the mountain barrier, and, defeating a vast host of Tartars who attempted to oppose their passage, extended their conquests to the Tobol, the Irtysch, and the Ob. Their wonderful march, or migration, was terminated by the subjugation of all the tribes dwelling between the Ural and the Altaic chains. In 1581 Yermak ceded his conquests to the Czar. "Thus," says Clarke, "was Siberia added to the extensive possessions of Russia by a Cossack of the Don."

Each Cossack community possessed the right of self-government, which was exercised much in the

same way as in that of the *setcha* in the Dnieper, subject to the duty of military service under the banner of the Czars. This was the tenure on which they held their liberties. Amongst themselves the spirit of equality perhaps never was less restricted: yet there was a proper regard to order. Any Cossack, by passing through the minor offices, might arrive at the highest place. When in the execution of his office the most perfect respect was paid to the official. When not on duty he was no more than any one of his companions in arms. Clarke noted how "amusing it was to observe the temporary respect they paid to their Attaman." If he convened any number of the inhabitants on any business, however trivial, they made obeisance before him, remaining uncovered and standing as though they found themselves in the presence of a sovereign. The moment the meeting was over he passed amongst them almost unnoticed, receiving no other mark of respect than that paid to a private individual. Though still freer than most of their fellow-subjects, the greater part of their privileges have been withdrawn. The right of electing their Attaman was abolished by Nicholas, and the dignity is now hereditary in the Imperial family, being attached to the titles borne by the heir to the throne.

The maritime enterprise of the Cossacks whose territories lay near the Euxine rendered them formidable to the Turks who had taken possession of the last remains of the Eastern Empire. Their habit of frequenting the banks of the rivers and islands lying in mid stream had necessarily familiarised them with the use of boats. They depended for their food chiefly on their fisheries, which down to our own time have continued to be very considerable. The popular idea that a Cossack in his natural state is simply a horseman is quickly dissipated when we know that more than one traveller has compared their capital to Venice. "Though not so grand as Venice," wrote Clarke, "Tscherkasski somewhat resembles that city." The entrance was by broad canals intersecting it in all directions. On either hand houses built on poles appear, during the periodical inundations of the Don, to float on the water. The inhabitants seem to be amphibious. Children may be seen to leap from the doors and windows of the houses and swim about like so many frogs. The capital was moved by the Hetman Platoff early in the present century to a spot a few miles off. Those of the inhabitants who left their old homes for Novo Tscherkaski retained the custom of building in force in their former abode. Though removed from the influence of the inundations the "houses," says Oliphant, "are still raised above the ground."

The amphibious habits of the Don Cossacks have apparently not yet forsaken them. During Mr. Wallace's voyage down the Volga, he had, as fellow-passengers on board the steamer, Cossacks, who "worked" their passages by jumping into the river, whenever the vessel got aground, to lay out hawsers and assist to haul her off. Their aquatic habits enabled the Cossacks of the Euxine and the Sea of Azov to carry on a long series of piratical or buccaneering campaigns against the Turks. Indeed, they sometimes extended their ravages almost to the waters of Stamboul. At the present day, when we hear so much of submarine warfare, it is interesting to find that the Cossacks had anticipated us by the adoption of a remarkable system of under-water tactics. On the faith of a Roman Catholic missionary we have it that in the seventeenth century they were in the habit of proceeding upon their excursions, warlike or predatory, in a number of small boats, which could be readily sunk and easily raised again. When pursued by any of the armed vessels of the Grand Signior, which they were unable to attack with any prospect of success, it was their custom to retreat into shallow water, and there allow their boats to sink to the bottom. The crews remained on board, and drew a supply of air for breathing through long tubes which were attached to floats lying on the surface. Thus concealed, they were rarely discovered; and when the enemy had retired, they would leave their places, and rise above water to obtain assistance to drag their boats into still shallower water, where they could be more easily got again afloat. The memory of these deeds still lingers in the breasts of the Don Cossacks, many of whom have told recent travellers that had they been permitted to fit out a flotilla of small boats during the Crimean war, they "would have captured the British fleet, as their ancestors used to capture the Turkish galleys on the Black Sea."

The history of the various Cossack families, and the system of polity adopted by each, show how great a measure of freedom they enjoyed, and how truly democratic was their mode of government. Their natural disposition, and the pitch of civilisation to which they have long attained, will be easily seen from a comparison of the various accounts of those who have visited them. In 1743, Jonas Hanway found them a "civilised and a very gallant, as well as sober people." The latter attribute we must take to be comparative, and the Cossacks, though, according to all accounts, infinitely the superiors in sobriety of the Russians proper, and of our own ancestors, perhaps, under the early Hanoverian kings, seem now to be able to imbibe a very fair share of strong liquors. The traveller, Clarke, is very lavish of his praise of the Cossacks, and equally exasperated with the Russians of the capital for representing them as uncivilised. As he spent some time amongst them, and as his book may be still regarded one of the classics of Russian travel—especially, too, as he has been corroborated by all subsequent visitors—we may summarise the result of his observations.

Travellers about to visit the Ukraine, and the districts traversed by the Don and its kindred streams, were warned by "an unprincipled race of men," the Russians of the northern provinces, that they would find the Cossacks little better than savages, and were bold in venturing their lives amongst them. In every respect, when compared with his fellow-subjects of the Empire, the Cossack has the advantage. His physique is finer. He is cleaner, better dressed, and more highly educated. In his own country no people can be found more honourable and hospitable than he is. On warlike expeditions and far from home he is a robber, because "plunder is part of the military discipline in which he has been educated." But he lays aside such habits when he again gets amongst his own people. Jonas Hanway had found the Cossacks "very clean and well cloathed." His successor asserts that there is no nation in the world more neat in regard to dress, and none—"I will not

except even my own"—more cleanly in their apparel. A Cossack in a dirty suit of clothes is never seen. In conversation the Cossack is, emphatically, a "gentleman;" he is well-informed, free from prejudice, open, sincere, and upright. "Place him by the side of a Russian," exclaims the traveller, "and what a contrast!" Yet it is on the authority of these very Russians that tales of Cossack barbarism have been circulated throughout Western Europe. They not only took an intelligent interest in all the processes of their democratic constitution, but in many circles of their capital were to be found all the pleasures and elegancies of a highly-refined society. He was invited to dinners which were magnificent and in good taste. In the drawing-room—the phrase *Cossack drawing-room* must seem a contradiction in terms to many—were to be seen elegant and accomplished women assembled round a pianoforte. In this remote corner of Europe were to be met with a wealthy and polished people, enjoying not only the refinements but even the luxuries of the most civilised nations. "The conversation had that enlightened and agreeable turn which characterises well-educated military men."

The pleasant disposition and social virtues of these reputed barbarians have been noted by more recent visitors. Mr. Schuyler, in his work on Turkestan, strongly corroborates the favourable account of them given by his predecessors, and repudiates the opinion of their barbarism held so widely in the West. Mr. Wallace, our latest authority, found them "agreeable and interesting fellow-travellers." Information collected by Alison established the fact that their industry was very considerable, their villages clean and thriving, and the houses comfortable. The manner in which the younger Cossacks acquitted themselves at the examinations of their university—for it seems there was even a Cossack university—Klaproth reported to be highly creditable. Mr. Laurence Oliphant found them richly endowed with that enterprising spirit in which Russians in general are so deplorably deficient. The Don Cossacks, in spite of the interruptions caused by frequent calls upon them to go upon military duty, were amongst the most energetic and enterprising of the subjects of the Czar. The wealth of some of the richer Cossacks is very considerable. Much of it naturally consisted in horses, and not many years since a stud of one thousand stallions was not an uncommon possession. There are stories also of vast treasures of gold and silver ducats hoarded by wealthy widows.

All travellers concur in speaking highly of the stalwart appearance of the men and of the good looks of women. To Hanway the latter seemed "gay and comely." Clarke found the women of Kasanskaia very beautiful. The German traveller, Moritz Wagner, though admitting that "amongst the girls there were some perfectly lovely forms," was surprised, considering how good looking the men are, to find comparatively few handsome women. Clarke was struck by the "dignified and majestic look of the Cossacks, and the ease and elegance of their gait." And Klaproth considered their features more handsome and expressive than those of the other Russians. Our latest author says that he had nowhere met—unless it were in Montenegro—"such magnificent specimens of the *genus homo* as amongst the descendants of the Zuporavian Cossacks."

These are the people of whom it is generally believed that they are mere semi-savage, marauding horsemen, good at pillaging and foraging, but of small worth as components of a regularly-organised and well-disciplined army. To many they are but few degrees superior to those terrible Turkish irregulars, the Bashi-Bazooks. When, during the Crimean war, complaints were made of the treatment of our wounded on the field by the enemy, a Russian officer is reported to have said that the rich adornments of some of our cavalry uniforms would prove too strong a temptation for most Cossacks to resist, though the plunder of their fallen foes would have to be preceded by massacre. This was actually used as an argument in favour of a plainer style of military dress. How true this is likely to be of the Cossacks of reality, and what right the Russians, who have deprived them of much of their freedom and scarcely conceal their jealousy of their polish and civilisation, have to give them such a character, the foregoing pages have perhaps in some measure tended to show.

CYPRIAN A. G. BRIDGE.

SALANG ISLAND

(Generally called by Navigators "Junkseylon").

So far back as the year 1350 (when the Siamese King Phya Utong laid the foundation of Ajuthia, the old capital), Salang is mentioned as one of the most important provinces of Siam. The Siamese were at that time in possession of the whole of the Malay peninsula. The principal places in addition to Salang on the west coast of Siam are mentioned as Malacca, Quedah, Nakon Si, Thamaralh (Ligor), Tanaosi (Tenasserim), Thavoi (Tavoy), Motama (Martaban), and Molamlong (Moulmein). About A.D. 1511 the Portuguese took possession of Malacca, and subsequently, in their wars with Burma, the Siamese lost also Tenasserim, Tavoy, Martaban, and Moulmein. The first Europeans mentioned as residing in Salang are the French missionaries, who arrived there about the year 1670, and from this date the number of Europeans would appear to have increased rapidly, for in the latter part of the eighteenth century it amounted to nearly one hundred, principally Portuguese and Dutchmen.

The Siamese appear to have been in undisturbed possession of Salang till 1796; but in this and the following years the Burmese made several attacks on the island, and finally, in 1809, after a long and sanguinary campaign, succeeded in conquering it. Most of the population then fled to the southern part of the island, and took refuge amongst the mountains. The Burmese did not follow them there, but left the island, after having laid everything in ruins and killed a large number of the inhabitants, many of whom they carried away with them as slaves. Stories are told in Salang about the bravery with which the Governor defended the island, and a large plain, close to the Governor's present residence, is shown as the place where his last army was conquered.

The Governor, after this defeat, fled to Bangkok, leaving his people to shift for themselves. The last

battle must have been very sanguinary: the place is still shown, close to some high trees at one end of the battle-field, where the Burmese are said to have killed their prisoners after the victory. When the Burmese left, many of the fugitives to the southern part of the island, who had settled in the low land between the mountains, now remained in the vicinity of Puket, in preference to returning to the scene of their burnt houses and destroyed plantations. Thus Puket, which was before almost unpopulated, got its first inhabitants.

Previous to 1796 the whole island was only a province of Siam, whilst all the surrounding districts, viz. Takuatung, Panga, Takuapah, and Koh Gao, were under the Governor of Salang. Salang was at that time moderately populated and well cultivated. Marks of prosperity are still to be found in many places, where dense jungle now covers the beds of former plantations of cocoanut and other fruit trees.

The principal place in the island, where the Governor then resided, was Ban Takien (now a village with about thirty houses), standing close to the Governor's present residence at Bandon, and nearly in the centre of the island.

Tharua (*i.e.* ship's anchorage), on the east coast, on a small river of the same name, was then the principal seaport,* and the town in which the Europeans lived. This place is said at that time to have been frequented by ships from Europe, and the many ruined houses show that the number of Europeans there must have been considerable. The Governor of Takuatung, now an old man, informed me that, some ninety years ago, his grandfather (at the time Governor of Takuatung) was very sick, and given up by the native doctors. Having heard much about marvellous cures effected by European doctors, he went to Tharua, where he found a ship with a doctor on board, and placed himself under his care. In a short time he was perfectly cured, and returned to his place. The present Governor attempted to give the names of both ship and doctor, but the pronunciation had been so much altered by being handed down *viva voce* from one generation to another, that it was impossible to make anything like a European name out of either.

Junkseylon must at one time have consisted of two islands, separated by a tolerably broad channel running across where now the villages of Tharua and Dinthale stand. This part is still very low land, and for the greater part of the year is nothing but a mire, only separated from the sea by fringing sand-banks along the east coast of the island. In this stretch of land many patches, only a little higher than the surrounding country, are still called islands (Koh). The Europeans living in Salang previous to the Burmese invasion are said to have worked the tin mines themselves: this is not unlikely, as in many places there are still traces of old tin mines which have been worked underground, following the tin layers, and not after the fashion of the present Chinese miners, who carry away all the earth on top of the tin layers to get at the ore. When the Governor of Salang returned after the Burmese had left, he found all the villages in ruins and the country almost depopulated. Since that time Salang has never risen to any importance, and this low fertile land, capable of sustaining a large population, had about a year ago only 2000 to 3000 inhabitants, mostly Siamese and Malays, who lived partly by fishing, and cultivating about as much rice and vegetables as kept them from starving.

Subsequent to 1809 the several provinces formerly under Salang made themselves independent of this place, and the island of Salang was divided into two governorships, the southern one of which was called Puket (from the Malay, *Buket*, a hill), whilst the northern one has retained the old name of Thalang (Salang). Some time after this both Puket and Salang were placed under the Governor of Panga, which at that time was rising to some importance. The governorship of Puket included at first only the high land in the southern part of the island, all the low land around Tharua and Dinthale still belonging to Salang.

The Siamese provinces are, according to their size and importance, placed under Governors of three different ranks: the most important by a Phya, the second class by a Phra, and the third class by a Luang.

Salang has from olden times been the seat of a Phya, whereas the first Governors in Puket were Luangs only.

In 1846 Phya Thalang died without leaving an heir, and the Luang Puket was promoted to Phya Thalang. Puket was thus left without a Governor, and Phya Panga sent therefore one of his higher officials to Puket, who by the Siamese Government was appointed Governor, with the title of Phra Puket. In 1853 this Governor died, and was succeeded by his son, the present Governor, who was permitted to assume the same title as his father.

Puket was at that time only a village with 450 Atap houses and some few dwellings scattered over the country, the inhabitants gaining their living principally by fishing.

Phra Puket now commenced working tin mines himself, and advanced money to Chinese miners to enable them to start business: this course he followed for years, and in consequence of the richness of these mines in Puket, the influx of Chinese continued to increase, till it reached its maximum some five years ago, when there was said to be the large number of 35,000 Chinese miners.

Since that time there has been a slow, but steady, decrease in the population, caused by a great rise in the prices of all necessaries of life, and a simultaneous decline in the prices given for tin. The value of tin was five years ago about 35 dollars per pikul = 133⅓ lbs.; and at present the value is only 19 dollars per pikul. In the year 1857 the King of Siam raised Phra Puket to the rank of Phya, and made him at the same time independent of Phya Panga. Some years after this the two villages of Tharua and Dinthale, with the low land between them, were taken from Thalang and added to Phya Puket's territory. In 1875 the whole of Salang was placed under Phya Puket, and Phya Thalang is now in the same position towards the Governors of Puket as these formerly were to him.

Phya Puket has several times attempted to improve the Chinese method of working the tin mines, and even once went to the expense of buying steam-pumps for pumping the water out; but the Chinese showed so much opposition to this, that the boiler

* Lieutenant Blair, who afterwards was employed on the first sketch survey of the Andamans, made a rough sketch of Tharua port and Pak-prah Strait, which was published as a chart by the East India Company.

and engines are now lying piled up opposite the Harbour-master's office, as a monument of the Chinese adherence to old customs, and of their prejudice against all new systems. The consequence is, that the old water-wheels and chain-pumps are still at work day and night in the wet season, but standing useless in the dry season for lack of water to drive them, the result being that all mining operations are stopped for two or three months in the year.

At present it is estimated that Puket has about 25,000 Chinese miners: these are divided into different sections, of which the Toopikongs and Geehens are the largest. These two parties were formerly always at variance with each other, and in 1866 there occurred a regular fight between them, in which many hundreds were killed on both sides. Since that time the Governor has always maintained a force of 100 men, under the command of a European, and the Siamese Government has constantly kept a man-of-war on this coast, to protect trade and assist the Governor in case of disturbances.

The principal places in the governorship of Puket are Puket town, Kathu, and Tharua.

Puket town, where the Governor resides, stands on the east side of the island on a small creek, and is connected with a landing-pier at the mouth of the creek by a good road, about 1½ mile long. Close to this pier stands the Harbour-master's office. The buildings in Puket are mostly wooden houses with Atap roofs, but still there are not a few brick houses, of which structures those erected for the reception of His Majesty the King of Siam, on the occasion of his visit to the island in 1871, are principally worth mentioning. These buildings are now the residence of a Siamese Royal Commissioner, lately sent to Puket to assist the Governor, who has been blind for some years. The Commissioner has done much to beautify the buildings, and has made a good road in front of them. Close to them stands the Governor's residence, including a number of larger and smaller buildings, mostly built in Chinese style, very solid, but without any pretension to beauty; they are all surrounded by a high brick wall. The so-called Government House is a large and neat brick building, erected on a hill close to Puket: it was built by the present Commissioner, Phya Moutri, who also has made a good road up to it, passable for a light carriage. Other brick buildings worth mentioning are a large stamp-office for tin, many tin-smelting houses, several barracks for the soldiers, and a fine two-storeyed building for the Commandant of the Governor's soldiers. Many of the Chinese traders and miners have also lately commenced building brick houses, and the market street would be a very fair one, if kept clean.

Puket town (called Tongkah* by the Chinese) is on all sides surrounded by tin mines, some of which are 50 feet deep—a considerable depth when it is taken into consideration that all the earth above the tin-layers has been carried away in small baskets by the Chinese miners. The Chinese in Puket will not, under any consideration, work underground, and hence the enormous waste of labour and money. They are very superstitious about their tin mines, and about an evil spirit's influence on the thickness and goodness of the tin-layers. The worst form such an evil spirit can appear in is as a European with boots and umbrella, and such a person would never be allowed to enter their mines, but a European without boots and umbrella is always welcome: he is then supposed to do more good than harm.

Kathu is connected with Puket by a good road, 6 miles long and running in a westerly direction. Kathu has about 8000 inhabitants, almost all Chinese, who work the important tin mines in the neighbourhood. To the northward of Puket another good road, 7 miles long, leads to Tharua, formerly, in Salang's "golden days," a place of importance, but now almost deserted; its fine market street still remains, with good brick-buildings to the number of thirty or forty, as also large ruins of houses belonging to the Europeans who resided here before the Burmese devastated the place.

Besides these three principal towns, there are in the suburbs of Puket a great number of villages of various sizes, inhabited partly by Chinese and partly by Siamese or Malays. Surrounding most of these villages are paddy-fields and plantations, for the productions of which a good market is found in Puket and Kathu. Around these two places, the cultivation of the soil is much neglected in consequence of the tin-mining operations.

The total population of Puket can at present be estimated at 25,000 Chinese, 2000 Malays, and 1000 Siamese.

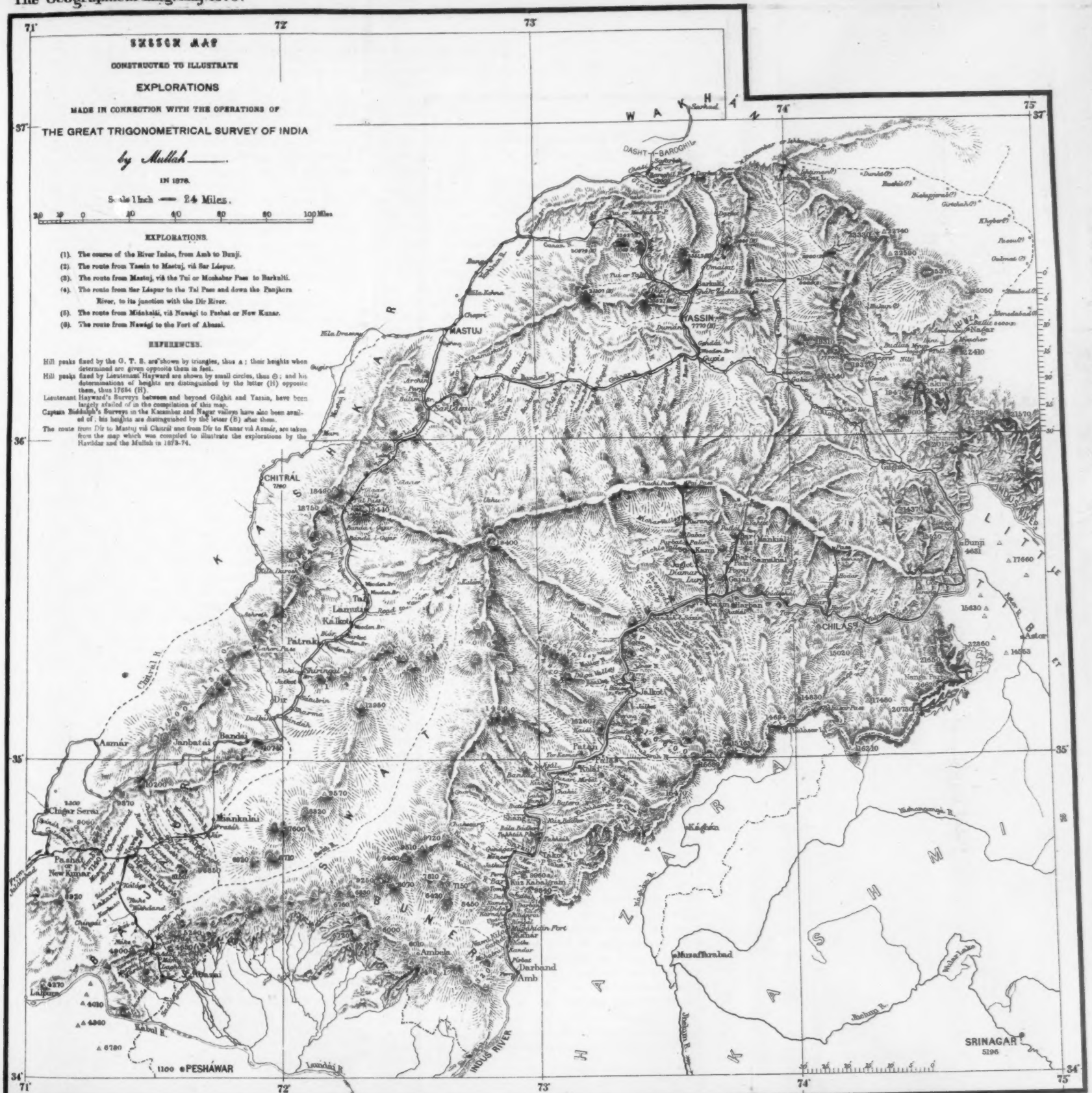
From 1809 to 1875 the trade of Salang seems to have been at a perfect standstill, with little or no mining going on, and scarcely any cultivation. Since 1875 Salang has been placed under Puket; and Phya Moutri, together with Phya Puket, have re-commenced tin-mining in different places. By their exertions more than thirty mines have already been opened up in Salang, in which a large number of Chinese are employed. Villages, plantations, and paddy-fields are also appearing in many places, where a short time ago there was nothing but dense jungle.

The largest village in Salang is Bandon, which is at present Phya Thalang's place of residence, and contains about 100 Atap houses. Phya Thalang lived formerly in Bangkrong, a village on the east coast of the island, but about three years ago he shifted to Bandon, in consequence of which Bangkrong has almost disappeared. The residence consists of a number of large, very neat, bamboo buildings, surrounded by a brick wall. The Governor is very hospitable, and maintains excellent order in his territory, but with insufficient means he is not likely to develop it in proportion to the richness of the soil and the progress made in the adjoining country of Puket. There can be no doubt that Salang is quite as rich in mineral wealth as Puket, and possesses a large amount of low fertile land; whereas Puket being very mountainous, it is not unlikely that in time Salang will once more become the leading place in the island.

The estimate of the population in Salang is at present—Malays, 2000; Chinese, 1500; and Siamese, 1000; total in Salang, 4500; and in the whole island, 32,500.

Junkseylon is certainly a very rich island, and there is every reason to believe that the land to the northward and eastward of it possesses a like abundance of

* European merchants now speak of the place as Tongkah.


SKETCH MAP
CONSTRUCTED TO ILLUSTRATE
EXPLORATIONS
MADE IN CONNECTION WITH THE OPERATIONS OF
THE GREAT TRIGONOMETRICAL SURVEY OF INDIA
by Mullah ——.
IN 1878.
Scale 1 Inch — 24 Miles.
EXPLORATIONS.
(1). The course of the River Indus, from Amb to Dunji.
(2). The route from Yasin to Mastuj, viâ Sar Léspur.
(3). The route from Mastuj, viâ the Tui or Mouhabar Pass to Barkulti.
(4). The route from Sar Léspur to the Tal Pass and down the Panjkora River, to its junction with the Dir River.
(5). The route from Mánkalí, viâ Nowagi to Pesháwar or New Kunar.
(6). The route from Nowagi to the Fort of Abazai.
REFERENCES.
Hill peaks fixed by the G. T. S. are shown by triangles, thus ▲; their heights when determined are given opposite them in feet.
Hill peaks fixed by Lieutenant Hayward are shown by small circles, thus ⊙; and his determinations of heights are distinguished by the letter (H) opposite them, thus 17684 (H).
Lieutenant Hayward's Surveys between and beyond Gilgit and Yasin, have been largely availed of in the compilation of this map.
Captain Biddulph's Surveys in the Kazanbar and Nagar valleys have also been availed of. His heights are distinguished by the letter (B) after them.
The route from Dir to Mastuj viâ Chitrál and from Dir to Kunar viâ Asmár, are taken from the map which was compiled to illustrate the explorations by the Havildar and the Mullah in 1873-74.
WAKHAN
DASHT-I-BAROGHIL
MASTUJ
YASSIN
7770 (H)
CHITRÁL
7760
Sar Léspur
Lamuta
Kalkot
Patrak
Dir
Asmár
Janbatai
Bandai
Chigar Serai
Mánkalí
Pashat or New Kunar
Laloma
Kabul R.
PESHÁWAR
1100
Ambela
Darband
Amb
INDUS RIVER
BUNER
SWAT
KOHISTAN
CHILAS
Bunji
4651
Jalkot
Pattan
Shang
Musafirabad
Jhelum R.
SRINAGAR
5196
HAZARA
KASHMIR

minerals. With the coast of this land properly surveyed, the interior explored, and some facilities and encouragement offered to miners, the revenue of Siam would rapidly increase. What a single energetic man can do Phya Puket has amply shown, and although blind, he is still the leading genius in almost all enterprises in the island. He has worked hard and honestly for his country, and changed Puket from a mere jungle into a sea-port, where now more than twenty steamers call every month. Tin, to the amount of about 100,000 pikuls, is exported from this place every year, and in proportion to the size of the territory the Siamese treasury receives from it a very respectable revenue.

A. DE RICHELIEU, Captain,
His Majesty's Siamese Navy.

DROUGHTS AND CLIMATES AT THE CAPE.

IN addition to the hardships of a Caffer war, the colony of the Cape of Good Hope has been visited by a severe drought during the last summer, accompanied by a fearful visitation of famine, as a scene in the drama of calamities that remote and undemonstrative settlement is sometimes subjected to. This drought seems chiefly to have affected the southern and western districts below the lat. of 30° S., long. 30° E., and, in a less degree, Natal, Transvaal, and the country N.E. of the Vaal river, which border on the semi-tropical regions of Southern Africa, and lie within the isothermal lines of 65° Fahr. This difference will correspond with the exaggeration of the weather elements of the climates of these two sets of countries, which consist mainly in the summer being the rainy season in January, in Natal, and the dry one at the Cape; and the winter season of July being the dry season in Natal and the wet one at the Cape.

The drought existing in the Cape Colonies seems to have been a maximum dry season, therefore, and it may probably be found that the isothermal lines between which it usually lies will have been pitched much further south than in ordinary years, and that the isothermal line of 70°, running through Walvisch and Delagoa Bays, has been transferred to the south of its usual position.

Now, if we speculate further, we may assume that the calms of Capricorn were still hanging during the summer about the Cape, instead of descending, as they usually do, below its latitudes at this time; and they are thus preventing the S.E. winds from emerging on their northern border from the Polar regions, and carrying the vapours of the southern seas to be condensed on the highlands of Southern Africa. It appears that northerly winds have been prevalent in the interior during this summer there, instead of S.E. winds, and the former are those most frequently found to the south of the calm belt; and they blow hot and dry and dust-laden from the Kalahari deserts and Karroo plains, and suck up the waters in all the rivers, valleys, and springs in their course southwards.

The temperature of the air had already been reported to have reached 107°·5 in the shade at Nelspoort, in the Niewveldt Beaufort district, lat. 32° S., on February 7th, 1878. We may further assume that the south temperate rain belt had not yet descended as far south as usual in the Southern Ocean, and that the south tropical rain belt had not yet reached the latitudes of the colonies on the S.E. coast, so as to feed the interior plains and mountains with thunderstorms, and bring up the moisture-laden breezes from the Indian Ocean.

Cape Argus, January 22nd, 1878, reports that this year has been a striking exception to the rule, as no heavy rains have fallen since May 1876—that is, nearly two years have elapsed since a saturating, life-giving rain has visited a large extent of this colony. The land has become as hard as a stone, and could not be ploughed, and the scanty crops were scarce worth reaping; vegetation got withered, the fountains dried up, and cattle and sheep perished by thousands from sheer thirst and starvation. Both the southern and western and northern districts have been visited by it, and it has reached from the Buffalo River, in the Worcester Division, to the Orange River, and from the Atlantic to the Indian Ocean. The result is that both the white man and the black man, Europeans and natives, are suffering from the want of rain causing the withering of vegetation and destruction of the cereals; and then comes starvation and gaunt and hideous famine to both man and beast.

In Swellendam the drought has been so severe that there has been no water to turn the corn and other mills.

Cape Argus, February 12th, 1878, reports that for the past three years the rains of the colony have been limited and unseasonable, and this year the rivers and streams having run low, and every drop of rain that has fallen lately has been evaporated by the thirsty sirocco of the deserts. Numbers of people in the interior are living on the meat of starved animals, and sheep and cattle die as they go and search for water; stagnant pools of poisonous water are guarded from the stock only to serve to infect the human drinkers with typhoid fever. Educated daughters of hitherto wealthy families seek service in the same kitchen with the native girls, and sons hunt for work as daily labourers and railway navvies; and many others are driven to the criminal alternative of stealing their food and drink. Drivers of waggons complain bitterly of the scarcity of water between Alice and Port Elizabeth, and the poor oxen can only get a drink at the large rivers, and many have died from thirst and starvation on the Bay Road.

It has produced the most curious and tantalising effect, both good and bad, at the great pit of the Kimberley Diamond Mine, as it has dried it up, and thrown the pumps out of employment, and saved the fuel, but has left no water for washing the matrix and extracting the gems.*

It will have been observed that droughts have affected Australia (*vide Australasian*, December 22nd, 1877) also during much the same periods lately, which leads one to infer that their causes are of a general cosmical character, and, in conjunction with the wet seasons that have prevailed in Britain for the like years, probably point to a vicarious action of the weather forces taking place in the northern and southern hemispheres at the various periods of the

* The Vaal river dried up so much as to be fordable on foot, its water stank offensively, and large fish passed down over the stones at the drifts.

year. By this it is intended to explain that when the seasons are wet in the northern hemisphere they would probably be dry in the lands of the southern hemisphere, and that, on the other hand, if they were dry in Britain, they might be conjectured to be wet at the Cape. We might not, however, be warranted as yet in inferring that these conditions would be simultaneous in each hemisphere, for that involves a conclusion that if the weather were wet in Great Britain in summer, it must necessarily be a dry winter at the Cape, or on similar meridians or like latitudes on either side of the Equator. But we may go so far as to suggest that a theory of vicarious action between the weathers of opposite hemispheres might be found to apply when the records of a whole year's observations, or a series of them in each extreme, were compared together.

It will be customary, in conclusion, to propose remedies to correct this recurring maximum condition of a dry season at the Cape, which will consist in the oft-repeated suggestion of the establishment of a Board of Woods and Forests in the Cape Government. This should superintend the maintenance of the existing bush and jungle, and promote the formation of new plantations on the remaining Crown lands, and to give encouragement to the landowners, by loans of money from the Treasury, to provide on their estates and pasturages these natural requisites for the formation and sustenance of perennial springs of water. Dams, or artificial reservoirs to catch and store the rain-water, seem to have proved insufficient to stay the effects of a drought, as the report from Graaf Reynet states "that the drought increases in severity, for the sun does not warm, but it burns; the springs are failing everywhere, and the dams were emptied long ago." In order to preserve the water in these dams from the evaporating forces of the drying winds and powerful sun, their banks ought to be thickly planted with the Orange River willows (*Salix Gariepina*) and thatch rushes (*Restio Tectorum*), and other trees and undergrowth, all abundantly flourishing on the banks of the great rivers in the colony, and which thoroughly preserve their secluded pools from heat and exhaustion in straitened seasons.

The loss in money value sustained by the colony by the mortality of sheep, cattle, and horses, and destruction of crops of wheat-mealies, vegetables, and fruits, must far exceed in amount any proposed loans of money that might be advanced to farmers, agriculturists, or stock-holders, to construct means for averting the direful waste of life and property effected by droughts.

The physical conformation of South Africa further favours the desiccation of the country, on account of the steep gradients of the course of the rivers to the sea, which let their waters run off rapidly. But, on the other hand, the geological features offer more promise, as the perpendicular fissures of the horizontal lacustrine shales permit the rains to run into them, and disappear down below into the basin of the Great Karroo beds, occupying the interior of the country inside the littoral rock formations. Now there are no breaks through these coast strata except the gorges of some of the great rivers, which let their waters out from the interior plains to the sea; therefore the Karroo or lacustrine beds probably contain supplies of water down below in their inferior layers.

The dip of these strata on the borders of the great porphyry, conglomerate, or breccia bed of Bain lies to the north or east or west, according as you face the equatorial direction from the south, west, or east: consequently, the water that has percolated from the surface rains should run down to the lower levels northward, and should there be found. Wells may therefore be sunk, or shafts dug, down into the Karroo shales, wherever found, as may be seen on consulting either Bain's or Dunn's Geological Maps of South Africa; and there is likelihood that water may be found there, as amongst our oolitic and chalky strata in England, which lie also horizontal and superficial and unconformable, on the older carboniferous formations below them.

The prospects of water from rock supplies outside the range of the conglomerate bed are less favourable in a geological point of view, as the Silurian slates have too great a dip and are too much broken up. The Table Mountain sandstone formations are, perhaps, better situated, as they are horizontal, and the fissures are therefore perpendicular; but they are placed on the high lands, and are not in continuous sheets, and so cannot gather large stores of water. However, they lie favourable for springs issuing out from their sides exposed in valleys, or from their bases reposing on sheets of granite or basalt below them, as is to be seen at the Platte Klip springs, at Cape Town. There are, besides, numerous tertiary beds scattered in detached areas along the southern coast outside of Bain's conglomerate, which would seem suitable ground for being tapped for rock water supplies for farms and villages, distant from perennial streams or springs.

W. J. BLACK.

Reviews.

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THE WAR SHIPS OF EUROPE.*

IN the present critical state of European affairs, when the war ships of England may be called upon for practical proof that her naval supremacy is in no way diminished since those days when "Hearts of oak were our ships," a perusal of this work, from the pen of a foreigner and an impartial observer, must tend to dissipate any doubts on the subject. No importance can now be attached to the significant words of the late Mr. Ward Hunt, when taking office as First Lord of the Admiralty, he said that "the British navy was composed of a phantom fleet!" The author of this work, Mr. King, Chief Engineer in the United States' navy, was directed by the American Government in the year 1875 to proceed to Europe for the purpose of "personally observing and reporting upon the recent construction and mechanical appliances" of the ships of war belonging to the different European navies. That they selected an intelligent and observant officer must be acknowledged by even the most casual glance at his report, for he not only gives an accurate description of the construction of our largest and most powerful ironclads, but describes the minutest details regarding their internal fittings, and gives a most elaborate description of their machinery. To obtain the extensive knowledge which Mr. King has published, it is evident, on the face of it, that he must have been in direct communication with the officials of

* *The War Ships of Europe.* By Chief Engineer King, U.S.N. (Griffin and Co)

the different dockyards and others acquainted with the designs and construction of our ships, by whom the requisite information was imparted to him. It is doubtful policy, especially in these days when one powerful ironclad is of as much importance as a whole fleet of wooden ships would have been a quarter of a century ago, to allow foreigners the free run of our dockyards and admission to all the minutiæ of our naval constructive department, so that they can not only ascertain for themselves the vulnerable parts of our vessels but proclaim them to the whole world. Perhaps it is in a spirit of sarcasm that the author quotes an extract from our dockyard regulations to the following effect, that "No foreigner is permitted to enter any of Her Britannic Majesty's dockyards without authority given by the Admiralty through application of the Ambassador or Minister of the country to which the person belongs, made to the Secretary of State for Foreign Affairs, naval attachés of the foreign Embassies in London excepted. Foreigners, including officers, whether singly or in parties, are always accompanied throughout the periods of their visits by an officer detailed for the purpose, and while all necessary attention is given, and every proper facility is afforded for viewing the works and ships under construction, *sketches or written notes are not allowed to be taken* except by special permission."

We must, therefore, conclude that the author obtained the sanction of our Admiralty for making an extensive collection of "sketches" and "written notes," and he has certainly made good use of his permission to do so!

The greater part of the work is devoted to the navy of our country. Whilst treating of it, the author gives a slight sketch of the gradual progress of the construction of iron-plated ships from the year 1859, when the building of the 'Warrior' was commenced, until the year 1877; and he gives a very complete history of the individual construction of our more modern ironclads. Then follow accounts of the navies of France, Germany, Italy, Russia, and Austria; whilst in an appendix is published lists of the Turkish, Dutch, and Spanish fleets. Whether he has placed the European navies in the categorical order of their power it is difficult to decide, but it would appear so by a careful study of their relative strength.

It cannot but be very gratifying for us to be told that "never since the application of steam propulsion to ships of war, has the British navy been relatively so strong as at the present time;" and since Mr. King wrote those words it has grown in strength to a very remarkable degree. He informs us that our private ship-building establishments are "unrivalled," and that our English ship-yards, besides building for our own Government, build yearly for other naval powers, France and the United States alone excepted. "Turkey obtained from the Clyde and the Thames a large proportion of her armoured fleet, including all the most powerful vessels. Russia, Spain, Holland, Italy, Denmark, Greece, Portugal, Brazil, Chili, Peru, and Japan all come to England to have armoured ships of war constructed. The Sheffield works not only supply armour-plates for these ships, but also plates and materials for war vessels built in Continental countries. The Elswick and Whitworth works manufacture guns solely for foreign orders. Besides this, all the nations above-named are customers of the English ship-yards and engineering works for vessels for their mercantile marine."

It will be thus seen that nearly every maritime power in the world relies, in a measure, upon English products and English industry to furnish them with the means of conveying their commerce from one country to another, and with vessels for the protection of that commerce.

Mr. King places the effective force of the British navy into three separate divisions. In the first are the ships that henceforth will fight our great naval battles; these he designates very properly as "ships of the line" (by the way, we are glad to see that the Admiralty have at length seen fit to have under their consideration the revision of the classes and denominations of Her Majesty's ships, originally established when the wooden line-of-battle ship was the fighting vessel of the day); in the second division he places the ships for our coast defence; and in the third our unarmoured cruising vessels, which includes our gun-vessels and small gunboats. These three divisions comprise a collective fleet of 400 vessels of all kinds, with a total tonnage of 900,000 tons. This, it must be acknowledged, is a very powerful force, and may be relied upon as something tangible, for it does not include 134 others that are "laid up or employed in permanent harbour service which are never likely to be sent to sea!"

The account of the 'Inflexible' cannot fail to attract attention, more especially of those who have interested themselves in the discussion which has recently terminated regarding the stability of that ship. Before any doubt had been thrown on the unseaworthiness of this "floating castle," Mr. King writes: "No war vessel yet designed has departed so widely from pre-existing types, and in none has so enormous a stride been made, in offensive and defensive powers, as in the 'Inflexible.'" It is satisfactory for us to know that the peculiar arrangements in this ship, and others of our navy, although they do not render them absolutely invulnerable to torpedoes, will serve in a measure to protect them from the attacks of these invisible and deadly foes; for we are told that "as a protection against the casualties of war and the sea, the hull is divided by means of the transverse and longitudinal bulkheads into no fewer than 135 water-tight compartments, and arrangements will be made for quickly removing any water that may collect within them through collision or other cause." These water-tight compartments have been tested by hydraulic pressure. Mr. King, in summing up the defensive powers of the ship, says that "it will have been seen that her double bottom is divided and subdivided into an unusual number of spaces, and that water-tight bulkheads have been introduced to an extent not before attempted, and, in fact, almost every conceivable precaution has been taken to make her secure against the ram and torpedo. If, however, she should be fairly struck by several powerful fish torpedoes it is quite probable she would be crippled, water-logged, or possibly sunk." This is certainly very consoling information to receive, when our preconceived notions of the destructive powers of a torpedo were, that the explosion of one in direct contact with a ship's bottom would infallibly destroy her; now we learn that if struck "fairly," by "several" torpedoes, there is only a "probability" of the vessel being crippled and perhaps sunk! It is gratifying to know that something, at all events, can be done to secure our ships from the much-vaunted power of the self-propelling offensive torpedo.

Mr. King enters into very full details regarding the enormous thickness of armour and solid teak backing of the citadel, but he omits to say anything of a very striking and important part of the 'Inflexible's' defensive capabilities, namely, those compartments next to the sides of the vessel, some 4 feet in width, which are filled with cork chips and shavings; inside this again are other compartments about 2 feet wide filled with layers of oakum and canvas, which have been found, by experiment, to partially close the apertures made by projectiles passing through, and also very materially to check the inflow of water. This is a novel and very important part of the construction of the 'Inflexible,' which, curiously enough, is not alluded to by Mr. King. With regard to the offensive powers of this ship, we find that she is to be armed with "four of the heaviest guns,"—namely those of 80 tons—"ever constructed," and will consequently be the heaviest armed ship afloat with the exception of the two Italian turret ships the 'Duilio' and 'Dandolo,' each of which mount two 100-ton guns! but we are also told that the 'Inflexible'

can be armed with "even more tremendous weapons," each of her turrets, with a slight modification, being able to mount a pair of 160-ton guns, having a length of 30 feet and a calibre of 20 inches! Well may these be termed "tremendous weapons!" There is a limit to all things, and we hope the limit of size for heavy ordnance may be drawn at the 160-ton gun.

In spite of the ponderous nature of the guns, we read that they can be fired, sponged, loaded, and brought to the firing position again in the incredible short space of forty seconds!—and all this is done by hydraulic power. With such strides has the science of artillery been developed, that with these huge engines of war we can maintain the same rapid firing that three-quarters of a century ago, with the guns then in vogue, enabled us to achieve those brilliant naval conquests of which we are so justly proud. The weight of the 'Inflexible's' broadside may be imagined when we are told that, "if ten shots were fired from each of her guns, she would use up 14,800 lbs. of powder and upwards of 30 tons of projectiles, at a cost of about 1320*l*." During the experiments for range with these guns, "shells were reported to have been recovered from a minimum distance of 6 miles; others were traced still further, until deep water arrested the progress of the explorers."

The construction of the other most important ironclads of our navy is as elaborately gone into as that of the 'Inflexible' Truly does Mr. King remark that the interior of one of our large ships is "a vast engineering workshop, requiring great skill and energy to manage it successfully."

Concerning the 'Alexandra,' our present flag-ship in the Mediterranean, which is fitted with twin screws, and consequently two sets of engines, we read that, "if one side of the ship be damaged, the engines on the opposite side can be worked independently."

There is little to be said regarding the vessels which the author places in the second division, namely, those for coast defence, and which comprise vessels of the 'Hydra' class, except that they are most formidable in every way, and, although classed as non-seagoing ships," are fully capable, should it be necessary, of vindicating the honour of the British flag in the Baltic or Mediterranean seas.

Whilst treating of our unarmoured cruisers, he informs us "that they are faster than the cruising ships of any other navy; besides which they are reputed to be excellent sea-boats, and fast under sail, and they are armed with rifled guns, some of which are of heavy calibre."

Chapter xi. is exclusively devoted to the cost of our armoured ships from the year 1866 to 1874: this embraces original cost and subsequent repairs—very important and very useful statistics.

The accounts of the other European navies, although, perhaps, not so exhaustive as that of our own, will be read with great interest, enabling us, as they do, to compare our strength with that of other maritime powers. The rapid growth of the German navy is somewhat remarkable. Less than thirty years ago they possessed one sailing corvette and two gunboats! Now, they possess a large fleet containing ships of the newest type, although they have nothing to match our 'Thunderer,' 'Devastation,' or 'Dreadnought,' to say nothing of the 'Inflexible.'

With regard to the Russian fleet, we are told that they have only "two vessels on the list of sea-going armoured ships which approach the modern standard of fighting efficiency." The description of the circular ironclads 'Novgorod' and 'Admiral Popoff' cannot fail to be of interest.

Mr. King, being an engineer, may perhaps be pardoned for having written at great length on compound engines, marine boilers, and sea valves and cocks; three chapters that would be more appropriate in a professional pamphlet than in one that professes to treat solely of the war ships of Europe.

A short chapter is also devoted to offensive torpedo warfare, whilst the organization of our Royal Dockyards and the Naval College at Greenwich is fully gone into. The book is profusely illustrated with plans and diagrams of the ships, their ordnance and machinery, and is produced in a manner to reflect credit on its publishers. Altogether we must congratulate Mr. King for the very comprehensive work, compiled with great labour by a painstaking and observant officer, which has been presented to the public at a very appropriate time; and although, as we have said before, we doubt the wisdom of the policy that enables foreigners to collect such a mass of important information regarding our naval organization, still the production of the *War Ships of Europe*, which will no doubt be carefully studied by any nation desirous of trying conclusions with us, will, by proclaiming our strength, materially assist in promoting peace.

A CATALOGUE OF MANUSCRIPT AND PRINTED REPORTS, FIELD BOOKS, MEMOIRS, MAPS, &C., OF THE INDIAN SURVEYS, DEPOSITED IN THE MAP-ROOM OF THE INDIA OFFICE. (Trübner & Co., Allen & Co., King & Co., and Stanford.)

A CATALOGUE of Maps of the British Possessions in India and other parts of Asia, published by order of Her Majesty's Secretary of State for India in Council, was issued in 1870; and a continuation of it, including maps subsequently published, appeared in 1872. In 1874 a tabulated Catalogue of all published Maps on sale was also printed, with an Index Map to the Indian Atlas; and in 1876 a second edition appeared, with a key Index.

The present Catalogue includes the whole of the permanent collection deposited in the Map-room of the India Office. It begins with Mr. Markham's Memoir on the Indian Surveys, and similar introductory papers; the Triangulation of India, including the famous measurement of the Indian arc of meridian. Begun by Col. Lambton, this trigonometrical survey of the highest order of exactitude, has been continued by his successors, Sir George Everest, Sir Andrew Waugh, and the present Surveyor-General of India, Col. J. T. Walker. In succession appear the reports of the Topographical and Revenue Surveys; the publications of the Geological Survey of India; the Schlagintweit Surveys; the Archæological and Marine Surveys.

The Indian Atlas, which combines the Trigonometrical, Topographical, and Revenue Surveys, on a scale of 4 miles to an inch, forms the second division of the Catalogue, and is followed by general maps, whether of the whole peninsula or of more than one administrative division of it. Under this head occur various specialties—copies of old Portuguese and Dutch drawings, commemorating their Indian tenure, together with maps of rivers, canals, and railways. The foregoing occupies about a fourth of the present Catalogue, which extends to 638 pages; the volume altogether, with its classified contents and index, being about 700 pages. More than half of the Catalogue consists of maps of varying age, arranged according to the actual civil divisions of India, and thus bringing whatever information is contained in them under the notice of the officials engaged in local government. In the case of maps of old and bygone divisions, those too are classified under the present political system, regard being had rather to the territory itself, than to any difference of name which the same locality may have borne at different times. The contents is besides intended to be a complete index to all the political divisions of the country that are actually in operation, whether under Native or British rulers, and whether separate maps exist of them or not.

The completeness of the collection or the contrary,

from that point of view, is thus laid open, and a key is provided to the political geography of India, its Presidencies, subordinate Governments, divisions, and districts, together with each separate native State or jurisdiction, and the principal divisions of those of large extent.

The materials are thus brought into view from which the actual delineation of India is derived. Here are many of the route surveys made by the first English pioneers into the interior, together with the marches of armies like Lord Lake's, and plans of battles like Plassy. Among many other interesting monuments of the labours which have become consolidated into an Empire are the original surveys of Rennell in Bengal, especially the delta of the Ganges, in 1764; the upper course of the great river, by Capt. R. H. Colebrooke, in 1796, and by Lieut. T. Wood in 1800; and Lieut. Webb's discovery of the sources of the Ganges and Jumna in 1810. In the south are Col. Colin Mackenzie's surveys in Madras and Mysore, and those of Ward and Conner, Turnbull, Garling, and others, in Malabar, Travancore, &c. No less interesting are the original drawings of Wood, Bedford, and Wilcox on the Brahmaputra, and of Lieut. John Wood on the Indus, besides the original map of his discovery of a source of the Oxus, and his surveys in Afghanistan, under Sir Alexander Burnes.

It is almost invidious to mention a few only from among the famous explorers and surveyors whose works are included in this Catalogue, and the brevity of such a notice is the only excuse. Before, however, turning to another branch, attention should be invited to such beautiful maps as those of Jhelum and Rawul Pindi, by Capt. D. G. Robinson.

The second part of the Catalogue is made up of Maps of Asia and its divisions beyond India; Maps in Oriental Languages; General Atlases and Maps; Indian Marine Surveys; and Indian Observatory Reports, astronomical, meteorological, and magnetical. Among the maps of Asia and its divisions beyond India are many of much interest and value; but the collection is not nearly so complete as the importance of the subject in connection with India would lead one to expect. The list of old charts is a wonderful testimony to the enterprise of past times, and in tracing the succession of Indian Marine Surveys, it is gratifying to observe that the revival of the Marine Surveying Service by the Indian Government is already bearing good fruit.

The alphabetical index which completes the volume appears to be exhaustive, and it can have no better commendation.

CAPTAIN GILL'S RECENT JOURNEY IN WESTERN CHINA supplies an interesting confirmation of the apparent existence of a belt of exceedingly moist region between the Tibetan plateau and the lands encompassing it on its north-eastern and eastern sides. Prejevalsky, in his *Mongolia and Tangut Country*, notices this feature while ascending the mountains south-west of Tajing; the Père Armand David noticed it during his residence at Mupin, north of Ching-tu-fu; Mr. Cooper, while making his way from the last-named place into Eastern Tibet; and Captain Gill's testimony now supplies us with a link between the observations of Prejevalsky and David, as he speaks of the wonderfully moist and semi-tropical character of the vegetation on the eastern side of the plateau, between the valleys of Sung-pan ting and Ling-ngan, on the extreme northern border of the province of Se-chuen.

Log Book.

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The Royal Awards of the Geographical Society for 1878.—The Council has awarded the Founders' Gold Medal to Baron F. von Richthofen, for his extensive travels and scientific explorations in China, and for his great work, now in course of publication, in which the materials accumulated during his long journeys are elaborated with remarkable lucidity and completeness. The Patron's Gold Medal has been awarded to Captain Henry Trotter, R.E., for his services to Geography, in having conducted the survey operations of the late Mission to Eastern Turkistan, under Sir Douglas Forsyth, which resulted in the connection of the Trigonometrical Survey of India with Russian surveys from Siberia; and for having further greatly improved the Map of Central Asia by uniting his own work on the Upper Oxus with the explorations of the Mullah and Havildar further to the west, so as to give, for the first time, a nearly continuous delineation of the course of the river, from its sources in the Pamir lakes to the frontiers of Balkh.

The Annual Prize Medals offered by the Society to the Public Schools have also been awarded as follows:—

PHYSICAL GEOGRAPHY.—*Gold Medal*, W. J. Newton, of Liverpool College. *Silver Medal*, C. M. Wilson, of Clifton College.

POLITICAL GEOGRAPHY.—*Gold Medal*. W. W. Ord, of Dulwich College. *Silver Medal*, G. A. Tomkinson, of Haileybury College.

The examiners were Col. J. A. Grant, C.B., and Mr. Clements R. Markham, C.B., F.R.S.

The late Captain F. Elton on the Nyassa Country.—Some private letters of the late Captain Elton, which have just reached England, give us very interesting information regarding the country passed through by him on his journey to Lake Nyassa. Speaking of Ramakukan's country (about 16° S. lat.), on the Shire, he says—"Cotton grows luxuriantly: I should like to see some one settle here, and manage cotton cultivation for Ramakukan. There would be any amount of labour available, excellent land, and a good reception from the chief; whilst Blantyre, on the hills, is within 1½ days as a sanatarium, and there is a medical man stationed here by the Established Church of Scotland."

Lake Nyassa he describes as follows:—"Lake Nyassa was at its best as we steamed up from Mponda's, at the beginning of the Shire river, yesterday forenoon—eight hours' voyage—just a ripple upon its glassy surface, and the distant range of 'Kirk's mountains,' purpling through the grey smoke of the numerous grass fires lighted at this season of the year, softened down the grand rugged foreground of precipitous cliffs, bold headlands, and isolated rocky islands, clothed to the water's edge with trees, the boulders at the feet of which are washed by its miniature waves. This morning the wind had raised a sea on the lake, which enjoys the reputation of being occasionally treacherous."

Captain Elton remarks of the Mission, that he is surprised at what it has really effected, looking at the difficulties it has had to contend with. He fears,

however, that they will have to seek another station, as the position is too isolated to enable them to do good to the lake people. The dreaded *tsetsé* fly infests the place, and the poorness of the soil prevents natives from settling in numbers. The slave-trade is still carried on, and Captain Elton states it as his opinion that the best way of putting it down would be by means of the appointment of a Commissioner, whose aim should be to detach the chiefs from the Arab slave-trade influences, and attach them to a policy of legitimate commerce and progress. Of the probable good effects of such a step, Elton speaks strongly and confidently. The difficulty in the way of trade is *carriage*, and to meet it he suggests the use of elephants, which are so plentiful as to be an absolute nuisance to the villagers. A few decoy elephants and a staff of elephant-catchers from Ceylon would enable a regular line of elephants to be utilised between Zanzibar or Kilwa and the lake. This would do away with the necessity of using the Portuguese Zambesi. One of the last remarks of the Captain is to warn "small men"—*i.e.* without capital—from "trying their luck" about Nyassa. This, he says, would infallibly lead to complications with the natives and Arabs.

Cook's Log Book during his Voyage of 1772.—Dr. A. Kirchhoff, President of the Halle Geographical Society, has discovered in the library of the University a copy (apparently) of part of the original log book of Captain Cook during his voyage of 1772. The book—a MS. folio, in brown leather—was bequeathed to the library referred to by John Reinhold Forster, Cook's companion, who died in Halle. It is headed, "Log Book kept on board His Majesty's Sloop 'Resolution,' Captain James Cook, Esquire, Commander." It begins with the departure of the vessels 'Resolution' and 'Adventure,' on the 13th of July 1772, and contains the usual entries of a log book up to the 11th January 1773, where it breaks off. Dr. Kirchhoff suggests that an extract given by him, and printed in the *Mittheilungen* of the Halle Geographical Society for 1877, p. 105, should be compared with the original log book, if in existence.

Colonel Prejevalsky writes under date 29th December, from Zaissan:—"The impossibility of penetrating into Tibet by way of Lob-Nor has compelled me to choose my route *viâ* Guchen and Hami, with the view of reaching Tsaidam, and eventually Lhasa, by way of the upper course of the Yang-tse. Having organised the caravan, and prepared ourselves for a long journey, we left Kuldja the 28th August for Guchen. As the principal road was watched by Chinese pickets, and part of it by squads of *champans* (convicts enlisted in the army), I took, in order to avoid any possible collision, an alternative way along the Ebi-Nor lake as far as the Saur mountains—the same route as that followed by Colonel Sosnofsky in 1875. It is true that this occasioned a *détour* of 250 versts, but we were sure of reaching Guchen without difficulty. We arrived there at the beginning of November, and ascertained that the route to Hami was unobstructed; but an unfortunate accident prevented our further march. The difficulties of the journey and the badness of the drinking water had made me very ill, and on arriving at Guchen I was utterly exhausted. It was thus impossible to continue the journey. There were no means of remaining there, far from all medical assistance, nor of dwelling in a miserable *yurt*, with the Centigrade thermometer showing 40 degrees of frost. I resolved to retrace my steps as far as Zaissan, and to recruit my strength before starting for Tibet. We arrived at Zaissan on the 20th December, where I am now under treatment, and the doctors give me hopes that I shall be well in a month or six weeks. The Chinese authorities at Guchen received us very surlily, and even refused us lodging, which obliged us to occupy a *yurt* outside the town: it was enough for one of us to be seen by soldiers to be subjected to every kind of insult. Generally speaking, the Chinese troops, as far as we could judge during our stay at Guchen, are completely demoralised, and their chief occupation consists in pillage. They told us that at Manas a soldier killed a shopkeeper in a quarrel, and that, as a punishment, the General sent him to the army fighting against the Dungans, with orders to place him in the front rank in the first engagement. . . . . I calculate on leaving Zaissan about the middle of February, and, journeying by way of Bulontokhoi to Guchen and Hami, I hope to arrive at Tsaidam in the summer, and to push on during the autumn to Lhasa, across the deserts of Northern Tibet. I believe that this delay will not affect the results of the expedition, provided always that I recover my health."

Austrian Expedition to the East.—An expedition has started from Austria for the East. Count Bela Szechenyi and two young *savans*, Messrs. G. Balinth and L. Loczy, propose to visit Bombay and Calcutta, Indo-China, Ceylon, the Sunda Island, Japan, and China. On arrival at Peking, they purpose to procure attendants, camels, and horses, and to journey into the interior of Central Asia, principally with the object of studying the Kuen-Lun range. The expedition expects to be away two or three years. We have since heard from India that Herr L. Loczy, the geologist, has slightly modified this programme by a journey to Darjiling, whither he arrived on the 9th February, and whence he has started for Independent Sikkim, with the object of studying some of the glacial formations of the Himalayas.

Correspondence.

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THE KARAKORAM.

To the Editor of the "GEOGRAPHICAL MAGAZINE."

SIR,—Although loth to trespass on your valuable columns, yet I venture to solicit space for a few last words on my part, a summing up of the friendly controversy between Mr. Trelawney Saunders and myself on the above-named subject.

Mr. Saunders has now put the whole question in a nut-shell. It is a question of fact not of principle. He pleads for "a distinctive name" (but does not suggest one) "for the mass which unites the two watersheds" (*versants*) "of Lake Lob and the Indus." He adds: "the *culminating summits of the south-western slopes of this mass* form a lofty range, to the whole extent of which (as defined by *the coincidence of the Lob and Indus basins)* I have given the well-known name of

Karakoram Mountains. This name was originally confined to the most frequented pass across these mountains."

If the facts were as Mr. Saunders conceives them, his nomenclature would be correct. But (1) the chain of culminating summits of the south-western slopes is *not* "defined by the coincidence of the basins," or, in other words, by the water-parting, for this occurs on the plateau often many miles to the north of the chain: and (2) the frequented pass called Karakoram does *not* lead across these mountains (which the alternative roads penetrate through the deep gorges of Murghu and of Kumdàn respectively) but across the water-parting some 25 miles further north.

With regard to the first point, the Indus-feeders have worked their way back through the bounding range into the high plateau behind.* It is an anachronism (measurable by geologic ages) to identify the water-parting with the bounding range at the present time. With regard to the second point, the Karakoram is separated from the mountains on the edge or slope of the plateau by the whole width of the Depsang plain, *i.e.* by a distance of some 25 miles (witness Mr. Saunders' own map, *Geographical Magazine*, July 1877). That is why I object to the name Karakoram for this bounding range. If Mr. Saunders will not accept my name of Eastern Muztàk for the chain of culminating summits of the south-western slope, he must find some new name, for it is evident that the Karakoram cannot possibly form at the same time both the water-parting of the streams which rise in the middle of the plateau and *also* the south-western boundary of that plateau.

As for my Eastern Muztàk, Mr. Saunders asserts that I would carry the "main range . . . . along the formidable spur which divides the Nubra from the Shayok" rivers. But he also points out that my diagram does not represent the true direction of the Nubra-Shayok range or spur, or, in other words, that the range set down by me is *not* the Nubra-Shayok spur. In this he is quite correct. I have never asserted that this is the "main range" (or even the bounding range of the plateau, which is the question in hand). The range which I represented in my diagram, and described in the text of my article (*Geographical Magazine*, for December, 1877), was one "continuing in a straight line *across the heads* of the Shayok river and of some of its feeders," not between and parallel to them. This mighty range formed by "the culminating summits of the south-western slope" or edge of Mr. Saunders's Tibetan plateau, has been sufficiently described by Dr. Thomson, Dr. Scully, and myself. It is quite distinct from the remarkable spur running between the Nubra and Shayok rivers, and equally distinct from the Karakoram water-parting.

Whether the Karakoram may also be considered a range or not is another question. Mr. Saunders now points "to observations of 20,673 feet and 21,638 feet at the head of the Karakash river where his Karakoram range terminates" as contradicting my statement that the Karakoram is devoid of bold eminences. But this remark goes no further than to show that where the Karakoram terminates, the bold eminences begin. That is also my contention.

Mr. Saunders invites me to connect my Muztàk range with the Gangri in a symmetrical manner. This I have never undertaken to do, partly because it may be that there is no symmetry. That the water-parting must be continuous, is certain; and that the plateau has an edge, so far as it is a plateau, is probable (though it might sink gradually). But Nature has never undertaken to supply a range to correspond everywhere. I merely come forward as an eye-witness to testify that on certain portions of the water-parting in the plateau, which are known to me, she has not placed a range of mountains, while she has done so at the edge of the plateau. She may have done differently further east.

If Mr. Saunders desires a systematic nomenclature for the actual facts of that region, I offer him the Karakoram plateau (a subdivision of the Tibetan plateau), bounded by the Kuen-lun range on the north-east, and by the Eastern Muztàk on the south-west, both of which are penetrated by the streams rising on the plateau on either side of the Karakoram water-parting, which is in places marked by a ridge and in places unmarked and almost imperceptible on the open plains of the table-land. How and where the south-western bounding range and the water-parting coalesce further east in the Gangri range, which seems to be both bounding range and water-parting, is a question which I have not investigated. But I do not know that this fact invalidates my observations of the Karakoram region.

Lastly, Mr. Saunders defends his exclusion of the table-land of Zanskar, Ladàk &c., from his Tibetan plateau, by the remark that I am confounding physical with political geography in asking for their inclusion; and that I am forgetting that *Western Tibet* is an exploded term as applied to Ladàk &c., since its acquisition by Kashmir (Mr. Saunders probably refers to the acquisition first of Ladàk and later of Kashmir, by the Chief of Jammu). As for that, I think it might as well be said that the name of Western Turkistan cannot be applied to Khokand, Samarkand &c., since these provinces have been acquired by Russia. Bengal, the Punjàb, Hindustàn, have not become exploded terms by these regions passing into English hands. But that is not the point. Physical characteristics and position at least do not change with a changing rule. Mr. Saunders cannot intend to say that Ladàk and Zanskar might be included in his geographical definition of the Tibetan plateau, but for their conquest by the Sikhs. Politics do not interfere to that extent with geography. I do not reckon Alsace to be still a part of France, but I do reckon it still a part of the Rhine basin.

Mr. Markham tells us: "Tibet or Bodyul is divided into four great provinces, called Kam, Ü, Tsang, and Ari (or Ngari). . . . . Ari is the mountainous region west of the Mariam-la (pass) including Ladàk."* Mr. Markham also remarks that "Tibet, the name now adopted by Europeans, came from the Turks and Persians, and is unknown in the country,"* and it so happens that it is precisely the province and town of Ladàk to which the Turks apply the name of Tibet, and from which consequently the rest of the country derives its European name. Great or Chinese Tibet is known to the Turks as *Ursang* (for *U-tsang*, the names of its two component provinces). But in situation, climate, natural features, race, religion, language, almost everything but political status, Tibet is all one, from Ngari to Kam. I therefore hope that Mr. Saunders will not exclude from the "Tibetan plateau as distinguished from the Himàlayan," the table-lands of the original and typical Tibet.

I have been led into this discussion by the wish to assist (by contributing to make it more exact in detail) Mr. Saunders's excellent attempt at systemising our knowledge of the Himàlayo-Tibetan upland. I now leave these points in the hands of Mr. Saunders and of your readers.

Yours, &c.,

ROBERT B. SHAW.

CALCUTTA, *February 25th*, 1878.

* See my map presented to the Royal Geographical Society in 1872. Capt. Trotter also, after crossing the Chang-lung pass northwards, descended into the deep ravines of a stream which ultimately joins the Shayok river and then ascended on to the *Lingzi-thang plain*, "in traversing which the traveller crosses, almost without knowing it, the water-shed (-parting) between India and Central Asia." (*Report of Sir T. D. Forsyth's Mission to Yarkand*, pp. 245-6).

* *Tibet* (Bogle and Manning), page xxvi of Introduction.

Proceedings of Geographical Societies.

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ROYAL GEOGRAPHICAL SOCIETY.

Meeting of 25th March, 1878.

SIR RUTHERFORD ALCOCK, President, in the chair.

The first paper of the evening was by Mr. H. B. COTTERILL, who had recently returned from an eventful exploration of the region between the north end of Lake Nyassa and the east coast, *viâ* Ugogo,

ON THE NYASSA AND A JOURNEY FROM THE NORTH END TO ZANZIBAR.

Mr. Cotterill first explained his reasons for visiting Nyassa. He had read with horror the descriptions given by Dr. Livingstone of that terrible scourge of Africa, the slave trade, and had determined to try to plant in Central Africa a germ of legitimate trade, which might in time serve as an antidote to the illegal traffic in men. The great expenses connected with a first attempt precluded all idea of a mercantile success, so that the liberality with which his venture was encouraged was all the more conspicuous. In addition to goods which he obtained from some friends, he received a present of a steel boat from friends at Harrow School. This craft, cutter-rigged and manned with ten oars, was built in compartments, and was 30 feet long. Mr. Cotterill then briefly described his adventures from the time he left England, in May 1876, with a party of Scotch missionaries, bound for Livingstonia, until he was floating on the waters of Nyassa, in his little vessel the 'Herga,' out-distancing Mr. Young's steam launch, the 'Ilala.' At first he tried to trade with a wily old chief, Mponda, but soon found that the Arab slave-dealing influence was too strong, and it was decided to visit other parts, where the probabilities of success seemed greater. After spending a few days with a friendly chief, named Tambala, who was anxious to welcome the white man to his country and would have nothing to do with Arabs, the party wished to return, but found it impossible to get bearers to carry the food. The people were afraid to go far from the village lest they should be enslaved, and even told the chief that they were afraid Mr. Cotterill would make slaves of them. Though eager to get cloth the poor creatures could not be persuaded to leave their homes. Pushing on with his own party, in the evening they passed a dead body with its slave stick by its side. They found another dead slave next day lying across the path.

After describing some excursions made up the lake, and not without great danger from storms which frequently sweep across it, and in one of which he lost medicine chest, notes, observations, cloth, beads, and other things, Mr. Cotterill related the events which preceded his meeting with Captain Elton and three friends in August last at the lower falls on the lake. As Captain Elton was anxious to return by a land route, they agreed to travel together from some point on the north or west coast of the lake of Dar-es-Salam, if that should be practicable. The mission authorities having kindly given them the use of the 'Ilala' they ran up the east coast, visiting several towns, and then crossed to the western shore. Here Mr. Cotterill ascended Mount Chombi, which he found to be about 4000 feet above the level of the lake. As they neared the north end of the lake, the weather became stormy, and it was decided to run into a deep inlet, about latitude 9° 40″, named Ruambadzi. The high land on the west of the lake trends off a little below this in a north-westerly direction, and as far as they could see left a flat marshy country extending towards the south of Tanganyika, which was said to be about ten or twelve days distant. They landed at Malisaka, a village of the Wachunga. The people were very shy, and not very friendly at first. They were totally naked, though they sometimes hung a banana leaf or bunch of grass from their waists. The chief, Mbungu, visited them and obtained a good present, in return for which he promised to supply men to the party. But the men professed to be warriors, and would not carry—that was a woman's duty. They could not be bribed with cloth, for they did not know any use for it, and did not want it. At length, many things being left behind, a start was made with fifty men. Mr. Cotterill, who through sickness was obliged to follow a day later, found, when he came up with the party, that every one of the carriers had disappeared, though they had been engaged for a five days' journey to Merere's. The whole country was here covered with groves of banana, some of them five miles in extent. They procured other carriers and crossed the river in the Chombaka valley several times, and passing two very beautiful little lakes. Kisewa was very much like the Alban lake, and looked almost like the crater of an extinct volcano. To prevent the desertion of carriers, they had to mount guard over them at night and keep the head-man in close confinement. On the whole, however, the party seemed to have gained, to a certain extent, their confidence, though the appearance of white men in the country produced considerable excitement and a good deal of terror in some cases. Cattle abounded and were easily procured, as well as sour milk and bananas, which form the principal food of the Wachunga. Their huts are circular, and beautifully built with bamboo or wood and oval bricks of sun-baked clay. The party now struck more to the north. A magnificent waterfall was discovered where the Luisi pours its stream down a steep cliff into the Chombaka valley. Crossing the range of hills, they found stretching away to the east and south-east a great plain bounded in the far distance by a towering range of mountains that evidently ran up from the eastern side of the Nyassa towards the north-west, and were the continuation of what Mr. Young had named the Livingstone range. The native name for these mountains and the surrounding country was Kondi. Several rivers intersected the plain running in the direction of Nyassa. The slopes of the hills in Kondi were extensively cultivated, the beauty and fertility of the country far surpassing anything Mr. Cotterill had seen elsewhere in Africa. They had been gradually ascending since leaving Nyassa, and when they reached Mazotes' they were at an elevation of 6000 feet above the sea. The cool mountain air was most refreshing; the grassy slopes, rushing streams, the herds of cattle with their tinkling bells, the wild flowers, forget-me-nots, buttercups, heaths, and many old familiar friends, made it like a dream of Switzerland. All the upper ridges of the hills were infested by robbers, who collected in considerable numbers on the heights, armed with great bundles of spears, to gaze at them. On one occasion about 200 of the brigands (called the Makauka) came down upon one of the party who was wandering from the camp, but a bold demeanour and a display of guns kept them from attacking him. The people of the valleys call themselves Wabena, though it is believed they are Wasanga, who have turned the Wabena out of this part of the country. All their carriers having deserted, Captain Elton, Mr. Cotterill, and another, with five of their men and a guide, started for the town of Merere's whose empire was said to extend from the Rufigi to Nyassa. Passing through forests of gigantic bamboos they crossed the Kondi range at a height of 8800 feet above the sea, and found themselves on a great plateau 7000 feet high, called Uwanji, a splendid cattle country, watered by many streams. They were stopped by the people and compelled to wait for three days until men had been sent to inform Merere of their arrival, and messengers, followed by a young Arab sent by one Suleiman bin Abed, who had lived at Merere's for many

years, came out to meet them and escort them to the town. Through a gap in the hills to the north a great plain could be seen, and from the edge of the plateau they saw across a vast plain, Usango, intersected by many rivers, among which were the Ruaha, rising in a gorge at their feet, and the Ranga. A lakelet into which the Ruaha and its affluents flowed was visible, and they caught the gleam of a larger lake on the far horizon, into which the Ruaha poured its waters, and in which there were said to be two islands. To the north-west the high plateau extends towards Usafa and Lake Hikwa, about four days distant. From the banks of the lake the natives informed them that a kind of salt was procured, with which they cured tobacco.

They were now stopped by a war between two tribes, the Machinga being engaged in ravaging Merere's country. Trying to maintain the character of neutrals they moved forward by night with a guard of sixty warriors whose faces were smeared with pipe-clay, and were escorted to a stockade and admitted into Merere's "boma." The smell from the filth in the stockade and the corpses lying outside was almost unbearable. The besiegers numbered about 3000, the garrison about 600, besides women and children, and the enemy having failed to take the place by assault and siege operations were trying to starve Merere's men. In their rage at a repulse on the previous day they had butchered in sight of the garrison about eighty women and children among their prisoners. The siege lasted several days, when the Machinga retired and the party pursued their journey. They suffered much for want of food during part of the journey, and Captain Elton began to break down. He was carried for two days, and on reaching the Kasigo became worse, but it was thought best to push on, for the rain was violent and the food was used up. At South Usekhe, after remaining unconscious for fifty hours, Captain Elton breathed his last and was buried—though not without difficulty, owing to the superstition of the natives—under a large baobab tree about 3 miles to the south-east of the village. A numerous caravan was found at North Usekhe, and having got fresh supplies from the chief Arab, they traversed the remaining 350 miles of the Ujiji caravan route, arrived at Bagamoyo, where they found Her Majesty's ship 'Vulture' awaiting them, and on the last day of February reached Zanzibar. They were four months and a half in making the journey from Livingstonia.

An interesting discussion followed the reading of the paper, several of the members bearing testimony to the admirable care and precision with which Captain Elton had kept his journal; and one and all regretting the loss the public service and the cause of exploration in Africa had sustained by his death.

The second paper was by Mr. J. L. HADDAN, M.I.C.E.,

ON OVERCOMING GEOGRAPHICAL OBSTACLES TO AFRICAN TRADE BY ECONOMICAL, ANIMAL, AND MECHANICAL EXPEDIENTS.

The author dwelt upon the advantages of the "Pioneer Railway" in a country like Africa. The principal features of this newly-invented system consisted in the employment of one rail instead of two, and the non-requirement of cuttings, sleepers, system of signals, &c. The "Pioneer," he said, was readily transportable; it followed the natural undulations of the ground, without disturbing the soil; it required neither tanks nor cuttings, and did not interfere with the water-partings, a most important element in the tropics. The rolling stock was handy, and could be shipped in running order, the engine weighing only four tons. The horizontal grip system of driving, adopted in the "Pioneer" locomotives, destroyed impetus, so that such a train might with safety run fast down inclines which ordinary railway trains could not face. In conclusion, Mr. Haddan hoped that, in order to prevent the loss of more valuable lives by exploration, the base of operations might, by means of this cheap railway, be so far advanced into the interior, that explorers might not be worn out before they could reach new ground.

In the discussion which followed Mr. STANLEY said that he would be very sorry indeed if the *Daily Telegraph* or the *New York Herald* had sent him single handed to build a railroad across Africa. What Mr. Haddan should do was to get a number of English capitalists to form an East African Company similar to the old East Indian Company. The British Empire had not yet begun to demonstrate what it was capable of. If they once reached Karagwe by the "Pioneer," or any other railroad, they would soon annex 6,000,000 square miles of territory. There were plenty of opportunities for trade on Lake Victoria, with its coast line of about 1100 miles. Usongora produced cotton; Uganda, ivory, furs and skins; Uvuma, hides; Usoga, magnificent timber; and a great number of other countries would bring their produce for the benefit of commerce when once steamers were launched upon the lake, and some such plan as the "Pioneer" connected it with Zanzibar. But it was useless for a small capitalist to think of doing anything for the good of Africa.

Captain CAMERON thought that Mr. Haddan's scheme for opening up Africa by a railroad was hopeless; but it had been fairly worked out in some instances. As no earthworks were required, the railroad could be transported from one place to another, according to the necessities of trade. Mr. Haddan's scheme illustrated the axiom of the unit of weight being equal to the unit of traction. The train would go up an incline of 1 in 7, and would thus be fitted to cross mountain-passes. It was originally intended to lay down such a line in Turkey and Asia Minor, but the political difficulties which had arisen had prevented the execution of the design. He had no doubt that if such lines had been laid down the "Pioneer" Railway would by this time have occupied a very high position in the quotation of shares. Mr. Fowler was constructing a railway across the Soudan similar to the railways in England; but Mr. Haddan's railway would have fully answered the requirements of such an undeveloped country, and would have entailed only one-sixth of the cost. Sir Fowell Buxton and others were now constructing a road from Dar-es-Salaam towards the interior. It was already open for a certain distance; and although it did not pay a dividend to those who had constructed it, having been made in the purest spirit of philanthropy, it did pay a dividend to the people in the surrounding district. A great deal of the work to be done in Africa must not be expected to return satisfaction to English pockets, but to English hearts and minds. The Map-Curator of the Society had shown him a model of a steamer that he had seen on the upper waters of the Fraser, and with such steamers, and the "Pioneer Railroad," communication might be opened up through the Nile, the Congo. and the Zambesi, into the very heart of Africa. He hoped that the "Pioneer" would be tried in the Transvaal, to connect the Diamond and Gold Fields with Cape Colony.

Meeting of 8th April, 1878.

On taking the chair, the PRESIDENT (Sir Rutherford Alcock) informed the meeting that the Council had awarded the Gold Medals of the year to Baron F. von Richthofen and Capt. Henry Trotter, R.E.

Captain W. J. GILL, R.E., then proceeded to read his paper

ON TRAVELS IN WESTERN CHINA AND ON THE EASTERN BORDERS OF TIBET.

Whilst at Shanghai in January last, Captain Gill received an invitation from Mr. Consul Baker, well known in connection with the Grosvenor Expedition, to accompany him to Chung-king, which he readily accepted.

Thence he travelled alone for a couple of months through Tzi-lu-king, Ching-tu, Lifan-fu, Sung-pan ting, Lung-ngan-fu, and back to Ching-tu, where he was joined by Mr. Mesny, to whom he was greatly indebted for the admirable and friendly relations they always maintained with the officials and the people, and with whom he travelled to Ta-sien-lu, Lithang, Bathang, Atentze, Tali-fu, Yung-chang, Tang Yuen ting, and Bhamo, whence an English steamer took them to Rangoon.

From Shanghai a journey by steamer of four days brings the traveller to Hankow, a distance of 680 miles. Following the course of the Yang-tze, through a long reach of uninteresting and monotonous country, the new port of Ichang was reached, and a month after they arrived at Chung-king, one of the most important towns of Sechuen.

Captain Gill described Sechuen as one of the most beautiful, perhaps the richest, and for foreigners certainly the most pleasant provinces in the empire; endowed by Nature with every charm of variegated scenery; giant mountains in the north, of whose peaks of perpetual snow little more has been known than the wild statements of ancient geographers that one of them attained a height of 36,000 feet; fertile plains, where in the driest season the rice-crop never fails; undulating hills, where streams have cut deep channels in the soft sandstone. The hand of man has not been slow to utilise these advantages; everywhere the hills are laid out in terraces for cultivation, irrigation is carried on to an almost inconceivable degree, and, although the inhabitants have not learnt the art of making water run up hill by itself, one of the most remarkable features in Sechuen landscape is the sight of the countless contrivances and water-wheels by which water is raised.

Nor is art neglected by the gentle people of this happy province, and the traveller, as in the evening he nears his journey's end, long before he arrives at the city where he is to sleep, is made aware of its vicinity by the numerous triumphal arches built across the road. These—ornamented with rich carvings, most artistically finished, of household scenes or official duties—have generally been raised by some widow to the memory of her deceased husband; and in these the design is as elegant as the workmanship is finished. The careful way in which everything is roofed here must strike the eye of any traveller.

Houses, gateways, bridges, triumphal arches, and, indeed, almost wherever it is practicable to put a roof, there one is sure to be; even the walls are often coped with glazed tiles, so that the timber-work, being built in the most solid manner and carefully protected from the weather by an efficient covering, lasts an incredible time, even in a country where rains and snow are regular in their occurrence.

Besides the officials, the people of this province are mostly either merchants or agriculturists, the *literati*—that generally highly-favoured class in China—being held in light esteem by the men of Sechuen; and to this is probably owing the fact that foreigners are always treated with great politeness, as wherever opposition to foreigners is carried to any great extent, it will generally be found to be owing to the influence of the *literati* class.

Captain Gill next gave a very interesting description of the manners and customs and mode of living of the Chinese, contrasting them with the Tibetans, in order more forcibly to demonstrate the habits of the Chinese. Sechuen, he proceeded to say, may generally be described as an exceedingly mountainous country; indeed, the only plain of any importance in the province is that in which the capital Ching-tu is situated. It is bounded on the north and north-west by mountains forming the buttresses of the great Himalayan plateau, which extends to the north-east across the whole frontier of this province.

Captain Gill's observations for height have enabled him to lay down two extensive contour lines of 8000 and 12,000 feet on the map. There are some, he continued, who still deny that the mountains of China are connected with the great Himalayan system; but when it is remembered that there is a high plateau commencing westwards of Lhasa, and extending with a sweep to the north right up to the Chinese province of Kansu, and that in all this there is no single point at a less elevation than 12,000 feet above the sea (the Kinsha is 13,000, in long. 94°, *vide* Prejevalsky's map), it seems to me that if there is to be any meaning attached to the word "*connection*," the Chinese mountains must be considered as belonging to the Himalayan system; and whilst on this subject I will, as briefly as possible, give the data on which I have, with what will perhaps be considered considerable rashness, drawn the contour of 12,000 feet. Commencing at the north-eastern extremity, the ridge that divides the Lung-ngan from the Sung-pan valley is crossed at about the snow-line (June) at an elevation of 12,500 feet, with peaks to the south somewhat higher; whilst still further south there are other peaks which, from their considerable elevation above the snow-line, cannot be less than 5000 feet, and where glaciers were reported to me as existing.

To the north of Sung-pan ting the road that leads to Koko Nor was described to me as very dreadful; my informant assured me that the wind cut great gashes in his face and arms, and was much disappointed because I could give him no medicine to protect him.

Sung-pan itself is upwards of 10,000 feet: behind it can be seen a very considerably elevated chain of mountains: and I have no doubt whatever that the water-parting between the two great rivers, the Hwang Ho and the Yang-tze, is in an upland considerably more than 12,000 feet above the sea.

Coming south-west to Lifan-fu, this place, though itself only 5000 feet high, is on a stream that, below this city, falls 1500 feet in 30 miles, and evidently descends with great rapidity from high lands above. Another sure indication of an elevated plateau is found in the fine, good-looking ponies that the natives bring down to Sung-pan ting and Ta-sien-lu. It is also surrounded by snowy peaks. Snow-fields were reported to me as within 20 miles, and glaciers at no great distance.

The region to the south-west of this is a little-known mass of mountains, and the contour cannot be laid down till about 8 miles distant from Ta-sien-lu. Thence to Bathang the road lies nearly always at an elevation of above 12,000 feet. A little beyond Bathang the Kinsha is crossed at an elevation of 7500 feet (Bathang is 8000), the road immediately rising to the water-parting between the Lan-tsang and the Kinsha at an altitude of 14,500. A little further to the south on the western face of the mountain lies Atentze, at an altitude of 10,000; and still more to the south the road again crosses back to the Kinsha basin over a pass, of which the altitude is about 14,000 feet.

From Ching-tu to Sung-pan ting the road is full of interest, both from the natural beauty and magnificence of the scenery as well as from the numerous historical associations of the place. Here is to be observed the civilised Chinaman in close contact with the mountaineer, who, now driven from the valleys, takes refuge on the steep hill-side or the wild fastnesses of the mountain gorges. Most picturesque there are the Mantzu villages perched on the summit of a crag, their gloomy stone walls with tiny holes for windows, and one high tower standing sentinel over the country.

The road is now at the level of the stream—now scooped out of the solid rock or propped up for a yard or two by rickety-looking stakes from underneath—now winding up the side of a valley where a cascade leaps down to join the foaming torrent below, or rising over a spur from the mountains that bound it. The ground is carpeted with beautiful and variegated wild flowers.

Leaving Ching-tu by the north-west gate, the road for eight miles is across the beautiful and fertile plain. Here the whole country is a perfect network of canals and water-courses, and, as the plain begins rising at the rate of 10 feet per mile, the streams are all rapid. The number of trees everywhere is very great all along the sides of the road, and between the fields are long rows of willows and a kind of beech; round all the houses are clusters. Now, there is a line of fruit-trees, oranges or apricots; here, a temple is enclosed by a wall with a number of fine yews inside; and, looking back from Chuen hien, the plain has all the appearance of being densely wooded.

Chuen hien is a busy place, situated at the embouchure of the river that here escapes from the mountains, and by a number of ingenious irrigation works is directed into the artificial channels by which the place is watered. The dams for this purpose are, like all Chinese contrivances, remarkable for their simplicity; large boulders, about the size of a man's head, are collected and put into long cylindrical baskets of very open bamboo network; these cylindrical baskets are laid nearly horizontal, and thus the bund is formed.

The road ascends the left bank of the river between mountains that here rise about 3000 feet above the stream, their sides so steep as to become in places almost precipitous, and now and then there will be on either hand vertical cliffs 400 to 500 feet high; these are of bare rock, and in them the road is often regularly scooped out, sometimes without a parapet, and only just wide enough for laden mules; at others, 6 or 7 feet broad, with a stone wall at the outer side.

Beyond Wan-Chuen hien is seen the first village of the Mantzu, or Barbarians, as the Chinese call them. The word Mantzu seems to be a sort of generic term applied by the Chinese generally to all the aborigines of this country, and many will include in it even the pure Tibetans, though the better-informed know how to distinguish between the different tribes.

Perched like an eagle's eyrie right on the top of an almost inaccessible hill, or like wild birds' nests in the face of some perpendicular cliff, these curious villages are very remarkable features in the landscape. The houses are of stone—the lower part with narrow slits for windows like the loop-holes of a fort. The roofs are flat, and on part of these is generally erected a kind of shed.

There are altogether eighteen of these tribes spreading over the country from Yun-nan to the extreme north of Sechuen. Each tribe has its king—one of them a queen, and they live almost entirely by agriculture and cattle-keeping.

It is not more than eighteen or twenty years since the Mantzu were driven from these valleys by the Chinese. Every town and village has some tale to tell of the fight with the Mantzu, and the numerous ruins, which from their appearance cannot be very old, prove how recent were the conflicts in which they were destroyed.

Sometimes a Chinese village is to be seen built close to the ruins of an aboriginal one, and the advance of the Chinese is thus presented to the traveller's eye in a very striking manner.

Two other tribes—the Su-Mu and the Ru-kan (or, as the people here call them, the White Mantzu and the Black Mantzu)—live up a river that debouches a little higher up. The Su-Mu are always ruled over by a queen. When the Tartars were conquering the land, this tribe happened at that time to have a queen for sovereign, who gave the Tartars great assistance, and, as an honorary distinction, it was decreed by the conquerors that in the future the Su-Mu should always be governed by a queen.

Leaving the main river the road to Lifan-fu strikes up a tributary, and the scenery changes. Instead of the magnificent verdure we had left, the mountains rose up almost precipitously, and, with the exception of a few blades of grass, are almost bare, standing like a long wall, almost unbroken even by a gully: at the bottom, if there should be a little flat ground, it is converted into fields of barley, divided by walls of loose stone, where a village with its flat roof only wanted a few tall, straight poplar trees to be a model of many a Persian hamlet lying in the valleys of the great Elburz: at a little distance the resemblance was remarkable, and at times I almost imagined myself nearer to the Atrek than the Yang-tze.

Leaving the Mantzu villages behind the country of Sifan was entered, the people being much more like Chinese, and very wild-looking.

The plateau between Sung-pan and Lung-ngan is scarcely inhabited. Great droves of yaks feed on the rounded hills, that here are covered with grass and brushwood, and where hardly a tree is seen. The summit presents a bare and dreary appearance, especially when viewed in mist and rain. A few patches of snow were lying within 50 feet of the highest point of the western face, and the ridge was crossed at an altitude of 12,500 feet. The characteristics of the eastern slopes are very unlike those of the west. Its climate appears much more damp. The growth of trees, flowers, ferns, and grass is so luxuriant as to become in appearance almost tropical. Great pine-forests clothe the northern faces of the mountain-sides, while the southern slopes are covered with rich green grass. The descent is very rapid, and lower down the hills on both sides are densely wooded with trees of the richest green.

About 30 miles from Lung-ngan-fu, a road leads to the east into the province of Shensi. Below this the silk manufacture commences; mulberry trees spoiled of their leaves surround the houses.

About 50 miles above Mien-chow the river is large enough for navigation, and descending to the city with a rapidity quite unknown in land travel, we were again in the plain country. The quiet mountain villages were left behind, and here, instead, the towns were big and full of people: numbers of labourers in the fields, coolies on the roads, and traffic on the river. There was an appearance of wealth and prosperity, of life and activity, about the country that contrasted remarkably with the miserable poverty we had left only a few hours before.

The city of Mien-chow is a large, well-built, and important place, protected from floods by very extensive, well-built river-walls; the streets nice and clean, and free from smells. In the market great quantities of beautiful vegetables were displayed, cabbages as round as cannon-balls, very fine cucumbers, and splendid turnips. Leaving Mien-chow everything showed that we had now struck a great high road. Quantities of coolies going both ways, chairs, ponies, and numbers of tea-houses by the roadside, enlivened the scene.

The crops are chiefly Indian corn, beans, and ground-nuts. Of the last the Chinese make oil, and they are almost as fond of eating them as they are of water-melon seeds, and at the stalls by the roadside are little piles of some twenty or thirty, which can be bought for a cash or two. There is also a good deal of rice, a great number of melons are grown in the gardens, and quantities of vegetables. The want of rain had been very severely felt here; some of the rice-fields were quite dry, and the Indian corn looked burnt up. The people were fasting, beating gongs, and burning incense-sticks, and the south gates of the cities were shut, in the hopes of propitiating the skies.

As Ching-tu is approached, the country is again entirely given over to rice cultivation, the Indian corn disappearing; and as we march westwards there is more and more water, until we again come to the streams running by the road-sides. At Ching-tu itself there was no want of water, though the drought when I was there was becoming very serious; but I have never heard that it eventuated in a serious famine in this province, though, as we know, the neighbouring one of

Shansi has been the scene of one of the most appalling calamities that were ever inflicted on a nation.

The road from Ching-tu to Ta-sien-lu traverses, roughly speaking, two sides of an equilateral triangle. There is, or used to be, a direct road, but it passes through a country much disturbed by fighting amongst or with the aborigines, and for centuries almost the circuitous route has been considered the great high-road to Tibet. The plain country is soon left, and 50 miles from Ching-tu the mountains that stretch from here to the Himalayas are first seen,

The main body of the Min river—only known here as the Southern river—is crossed just beyond Chiung-chow by a bridge, which is 240 yards long and 9½ wide, and has fifteen arches, and is really a very fine work.

Ya-chow is a place of great importance, as it is the starting-point of all the commerce to Tibet, to which place tea and cotton are the chief exports. The most remarkable trade of this place is its commerce in tea, vast quantities of which are sent from here through Tibet, and up to the very gates of our own tea-gardens in India. The tea for the Tibetans is merely the sweepings that would elsewhere be thrown away, the poor Chinese in Ya-chow paying seven or eight times the cost of this for what they drink themselves. The average load for a coolie is about ten or eleven of these packets. I have seen some carrying eighteen—that is, 432 lbs. Little boys are constantly seen with five or six pau (120 lbs.) These men wear a sort of framework on their backs, which, if the load is bulky, often comes right over the head, and forms in rainy weather a protection from the wet.

A little further on in one of the valleys there are a considerable number of the celebrated insect trees of Sechuen. This is a tree on which is bred the insect that produces the white wax of Sechuen. These trees are in appearance like an orange, with a smaller leaf. They have a very small white flower that grows in large sprays, now (20th July) covered with masses of blossom, and the strong smell, which was not very sweet, filled the air. This tree is chiefly grown in the Ning-yuan-fu neighbourhood, and the eggs are thence transported towards the end of April to Kia-ting-fu, where they are placed on the wax tree, which is something like a willow. Here the insects emerge from their eggs, and the branch of the tree on which they are placed is soon covered with a kind of white wax, secreted. It is this white wax that is so celebrated, and is one of the most valuable products of Sechuen.

Ta-sien-lu may now be considered as the boundary of China, for up to this point the people are governed directly by the Chinese; but beyond this there are native chiefs who, subject to China, rule over the people.

Ta-sien-lu is situated in a small open valley at the foot of mountains, enclosing it on all sides except to the east. The brawling stream that divides the city into two parts is crossed by a wooden bridge, and a good many trees grow about the banks. The streets of the place are narrow and dirty, the shops inferior, and in them are all sorts of strange wild figures, some with matted hair, and others with long locks falling down their shoulders; they dress in a coarse kind of serge or cotton stuff, and wear high leathern boots. The women wear a good many ornaments, some are good looking and all utterly unlike the Chinese in every way.

Both the women and the men wear great quantities of gold and silver ornaments, heavy earrings and brooches, in which are great lumps of very rubbishy turquoise and coral. They wear round their necks charm-boxes; some of gold, others with very delicate filagree work in silver. These are to contain prayers.

Here and all through Tibet the Indian rupee is the current coin; and only those who have gone through the weary process of cutting up and weighing out lumps of silver, and disputing over the scale and asserting the quality of the metal, can appreciate the feelings of satisfaction at again being able to make purchases in coin.

These rupees come in thousands all through Tibet, Lhasa, and on to the frontiers of China, where merchants eagerly buy them up, and by melting them down are able to gain a slight per-centage. Curious it is, too, to see the wild-looking fellows, as well as Chinamen, fastening their coats with buttons on which is the image and superscription of Her Most Gracious Majesty. There is scarcely a regiment in our service whose buttons do not find their way into Tibet. The old clothing in India is, I suppose, sold, the buttons bought by Indian traders and carried across the Himalayas, whence they gradually work their way eastwards. Lower down, imitation 4-anna pieces are used. These must be made somewhere in England.

From Ta-sien-lu the road at once ascends to the great plateau. The ascent is not a severe one—a gradual rise up a valley amongst granite rocks, capped at the summit with bare crags of limestone.

On the road are great droves of yaks, with enormous horns and heads like bisons, huge bushy tails, and hair under their stomachs reaching to the ground.

On passing the crest of Cheh-toh-shan the great upland country is at once entered. Standing on the summit of the pass, stretched below us was a fine valley, closed in on both sides by gently-sloping, round-topped hills, all covered with splendid grass. The richness of the pasture was something astonishing. The ground was yellow with buttercups, and the air laden with the perfume of wild flowers of every description. White currants and gooseberries, barberries, a sort of yew, and many other shrubs, grew in profusion. By the side of a little tent some Tibetans were lying about, their fierce dogs tied up to pegs in the ground, and great herds of sheep and cattle grazing round them.

The road to Lithang is a succession of mountainous valleys, huge pine-forests, and open glades. Just before reaching this city the mountain Shiehla is crossed at an altitude of 13,700 feet. From here gentle slopes lead down about 700 feet to the plain. This is 8 to 10 miles wide, and stretches out for many miles east and west. Opposite, a range of hills bounds the plains; behind it rises a magnificent range of mountains, stretching as far as eye can see to the east and west; snowy peak rising behind snowy peak—where, even at that great distance, vast fields of snow almost dazzle the eye as the sun shines on them.

A river winds through the centre of the valley, and numerous streams run down from the mountains on each side; and at this season of the year, when covered with luxuriant grass and wild flowers, one can hardly regret that the excessive cold prevents anything else from growing. No cereals of any kind nor potatoes can be raised. Just round the houses at Lithang a few half-starved cabbages and miserable turnips appear to be the only things that can be produced.

Lithang is a cheerless place, situated at an altitude of 12,500 feet. The people said that it rained here every afternoon in the summer, but that the mornings were generally fine. Though there are only 1000 families in the place, there is in the city a Lamassery containing 3000 Lamas, and within 5 miles another not much smaller. This Lamassery is adorned with a gilded roof, which has cost a large sum of money, notwithstanding the miserable poverty of the place. Its chief productions are gold, sheep, horses, and cattle. There are 300 Tibetan soldiers and 98 Chinese soldiers scattered about the neighbourhood.

The natives said that Ta-So, the last mountain-pass between us and Bathang, was a very bad medicine-mountain. The inconvenience caused by the rarefaction of the air at these great altitudes is attributed by them to subtle exhalations, and they always speak of a high mountain as a medicine-mountain. Before reaching this, the magnificent mountain of Neu-da, 22,000 feet high, is passed.

Just over the crest of the pass (15,600 feet) is a great basin 2 miles in diameter, and such a wild and savage scene I never before looked on—a very abomination of desolation. Great masses of bare rock rising all round; their tops perpendicular, torn and rent into every conceivable shape by the rigour of the climate. Long slopes of *débris* that had fallen from these were at the bottom, and scattered over the flat of the basin. Great blocks of rock lay tumbled about in most awful confusion amongst the masses that cropped out from below the surface. Three or four small ponds formed in the hollows were the sources of the stream that, descending from the basin, plunged into another valley, and, falling rapidly, soon became a roaring torrent, dashing through mile after mile of dense pine-forest.

The stillness of this place was very remarkable. The air was so rarefied that I could hardly hear the horse's feet only a few yards off, and when quite out of hearing of these, as I walked on alone, the silence was most impressive.

The town of Bathang is quite new, having been destroyed a few years ago in a frightful series of earthquakes that, lasting over many weeks, devastated the whole neighbourhood. The plain of Bathang only covers an area of a few square miles, producing barley, wheat, and Indian corn.

The climate is remarkably warm, as it is at an altitude of 8000 feet. It is on a small river of about 25 yards wide, that five miles lower joins the Kinsha, there 170 to 200 yards wide. Bathang contains 300 families, residing in about 200 houses. It is chiefly remarkable for its immorality and its Lamassery, containing 1300 Lamas, whose golden roof cost upwards of 1000*l*.

To insure our safety on the road to Atentze, the chief magistrate of Bathang came with us to that town, accompanied by the native chief and a large retinue, which day by day increased in number, until on the 3rd of March we had 300 men with us.

Then, when we had reached the place where the great Lhasa road branches off, on a high plateau in a storm of wind and sleet the somewhat exciting spectacle lay before us of an encampment of 300 Tibetans turned out by the Lamas to bar the road to the centre of Tibet.

The boundary between Yun-nan and Bathang is crossed at the Tsa-leh mountains 14,500 feet above the sea. This is also the water-parting between the two rivers, the Lan-tsang and the Kinsha. The country gradually descends from this point, the scenery changes and the climate becomes warmer. Atentze (10,000 feet), on the western slope of the mountains, is a Chinese town, but the people are thoroughly Tibetan, even the Chinese talking Tibetan better than their own language. The prevalence of goitre in these districts is something appalling; some attribute it to the water, others to the salt, but, whatever the cause, two-thirds of the population have swellings on their throats, some of enormous size. All the country between the two rivers is covered with forests, in which there are many wild beasts—amongst others, wild oxen and monkeys were reported.

From Atentze the road again crosses to the Kinsha river and follows it for two or three days, when it, for a third time, crosses the ridge and descends to the town of Tali-fu.

The country for many miles round this city still bears the traces of the Muhammadan rebellion: ruined villages and terraced hill-sides, where now no crops are raised, attest the sparseness of the population. Sechuen is over populated, and a very little Government assistance would enable the people to emigrate to this province. This, however, they cannot obtain, and it must be a long time before this beautiful and naturally-wealthy country can again become a flourishing one.

For many days before reaching this city we had been almost always marching in heavy rain, and the valleys were now all flooded, so much so that the rice crop was lost, and in Tali-fu I saw myself the young rice, on which the ear had hardly formed, being sold in the streets as green fodder for animals.

From here we followed in the footsteps of Mr. Margary, and the expedition that was sent to inquire into the circumstances of his death. Wherever we went, and whoever it might be that spoke of Mr. Margary, he was always referred to in terms of almost affectionate regard, and, standing at the scene of his cruel murder, I could not but feel what a loss the country had sustained in that brilliant young officer, who, through sickness and the difficulties surrounding a pioneer in new and untravelled districts, had not only carried out with singular tact the delicate duties entrusted to him, but had also known how to portray in striking and vivid colours the many new scenes presented to his view, and to leave a faithful and lasting record of the strange peoples and countries through which he passed as a legacy to regretful countrymen.

The direct road from Yung-chang was pronounced impracticable, owing to the fact that it passes over a plain entirely depopulated by the plague that appears every year in June or July.

The symptoms described appeared to coincide with those described by Broccaccio in the plague at Florence in 1348, and by Defoe in the plague of London.

Near Yung-chang, my informant said that during July, August, and September, more than 1000 people died of this complaint. A traveller who had passed the stricken districts in July said there were scarcely any inhabitants left, and that the dead bodies were lying about unburied: he added that the disease had moved southwards, and was raging in another district.

Beyond Yung-chang is the valley of the Lu-chiang, so unhealthy that no stranger can at any time sleep here (so they say) without getting fever. In the summer months it is quite impassable. Even the inhabitants leave it, and ascend to the mountains.

The miasma that rises is said to be a reddish mist; the ordinary white mist that I often saw hanging over the valleys in this neighbourhood is said to be harmless.

We were fortunate in the time of our passage, and the sun shone brightly as we crossed the curious suspension bridge that spans the river. It is in two spans of 73 and 52 yards; but for greater ease in tightening up the chains, the two are not in the same straight line. In construction each span is identical with that I have already described.

In rainy variable weather at no season of the year will any one attempt the passage of this valley; and Marco's words, "So unhealthy that no stranger can pass in the summer time," were brought strongly to my mind.

At Bhamo, coolies, mules, and ponies were left behind, and coal and iron swiftly bore us down the broad bosom of the Irrawaddy to home and civilization.

The PRESIDENT said Capt. Gill had determined by an elaborate series of observations, which would appear in the "Proceedings," but which time had not permitted to be read, the altitudes of the various mountainous regions he had traversed. No previous traveller had done this; and their perfect scientific accuracy might be relied on, as his hypsometrical instruments had, since his return, been tested at the Kew Observatory. His work had been done from a pure love of Geography and Science, and entirely at his own expense.

A second paper was read by MR. T. W. GOAD:

ON LIEUT. WHEELER'S (U. S. ENGINEERS) EXPLORATIONS IN NEW MEXICO.

The object of the survey was the collection of data for a series of topographical atlas maps, upon a scale of 1 inch to 8 miles of the territory of the United States west of the one-hundredth meridian, each sheet representing an area of from 17,000 to 18,000 square miles, and so projected that the several sheets might be joined to comprise entire political or other divisions. During the years between 1867 and 1873 an area of 228,150 square miles had been surveyed in California, Arizona,

Utah, Colorado, and New Mexico; but since that time the area had been probably doubled. Mr. Goad, who was one of Lieut. Wheeler's party, could not give a complete history of the survey, but confined himself to the exploration of New Mexico, during the season of 1877. The section surveyed lay between the 105th and 108th meridians, and between the 33rd and 35th parallels, comprising an area of about 15,600 square miles. One half of this country was mountainous, the rest being mesas and plains. Their route was from Fort Lyon across the Costilla mountains into New Mexico, and down the Rio Grande to Fort Craig. The ranges occupied by the division were the Magdalena mountains, San Mateo, Fra Cristobal, Oscura, San Soledad, Sierre Blanca, del Sacramento, Capitan, Carrizo, Jicarilla, and Gallinas. The mesas were those situated between the Oscura and Mazana mountains, and the Gallinas and Rio Grande. The plains of Jornada del Muerto, those between San Soledad and Sierra Blanca mountains, and between the Gallinas and Oscura mountains. The principal rivers are the Rio Grande del Norte and Pecos, which drain a considerable extent of country; and creeks and springs were found in the mountains, but in the plains water was very scarce. Numerous tribes of Indians were met with, but during the whole time of their sojurn in the territory they were never interfered with, and never lost an animal. Sante Fé was the most important town through which the exploring party passed, and second to it was Albuquerque, on the left bank of the Rio Grande del Norte. The surrounding country yields a considerable amount of grain and the vineyards and orchards are most productive, doubtless owing to white colonization. The maximum heat was 102° Fahr. in the shade, and between 120° and 130° in the sun. In November the minimum recorded was 29° below freezing, although in the previous year it was 16° below Zero. The rainy season is in July and August, when thunderstorms are frequent; and during a heavy rainfall in what is termed the monsoon the fall is estimated at from 2 to 4 inches an hour. The climate of New Mexico is delightful, for at no season is one deprived of sleep by excessive heat, nor does the dry cold affect the body; and if the Mexicans were a little more cleanly, Mr. Goad had little doubt but that their curse, the small-pox, would disappear.

The PRESIDENT complimented the author of the paper for the interesting account he had given of the topographical survey which the Government of the United States had caused to be made.

Sir HENRY RAWLINSON said he had no information to give with regard to the country traversed by Capt. Gill, but he thought it would be a great pity if such an interesting paper did not elicit some discussion. In many respects Capt. Gill's paper was one of the most remarkable that had ever been read before the Society. This was not the first occasion that Capt. Gill had done good service to Geography. A few years ago he accompanied Col. Baker to the frontier debatable land between Persia and Russia, a region which very possibly, in a not remote future, would become of the greatest political interest. He assisted Col. Baker in mapping all that region, and brought back most valuable scientific information. He had never received the credit which was due to him for that journey, and therefore, *en passant*, he (Sir Henry Rawlinson), on behalf of the Royal Geographical Society, tendered him their best thanks for what he had done on that occasion. Subsequently Capt. Gill proceeded to China, and was enabled, by his possession of ample means, to set out from Shanghai and travel clean through China into Burmah. The Royal Geographical Society had always declared that they did not pursue Geography as a mere abstract or dilettante science, but looked at practical effects. They considered Geography in its relation to the progress and advancement of civilization and the spread of commerce. The great practical point in Capt. Gill's journey was that he proceeded along one of the great trade routes of the world, which had always attracted much attention, and probably in the future would attract still more—the trade route from Sechuen to Lhasa, and through Tibet to India. One of the most interesting points alluded to in the paper was the route from Bathang across the frontier to Lhasa, and he wished to know what Capt. Gill's opinion was as to the possibility of opening out that route. The Che-fu Convention provided for such a possibility, and over and over again it had been in contemplation to send an expedition along it, either from India to China, or from China to India. That was really one of the most important geographical problems still remaining unsolved in Central Asia, and one to which great interest was attached, not only by geographers, but by politicians and merchants. Many parts of Captain Gill's route were entirely new, such as the detour he made to the mountains from Chengtu northward, and any details he could give with regard to the tribes in those mountains would be of exceeding interest. He also thought the route from Bathang to Tali-fu was new. Capt. Gill must have had excellent opportunities of making himself acquainted with the capabilities of Sechuen, and any information he could give on that subject would be of great interest.

Captain LOCKHART and Sir WALTER MEDHURST also congratulated Capt. Gill on the result of his journey.

The PRESIDENT was pleased to hear the testimony which Capt. Gill had borne to the good qualities of the Chinese. Englishmen were too apt to regard them as a degraded and immoral people.

CAPT. GILL thanked Sir Henry Rawlinson and Dr. Lockhart for the kind way in which they had spoken of his travels, and in answer to the former said, there were two roads to Lhasa, one from Ta-sien-lu northward, to a place called Cheng-tu, and then straight to Lhasa. It was reported to him as being a very fair road, and no doubt it was, as it kept on the high plateau. Traders used it to a great extent, but there were no Chinese officials there. The other road struck off to the west. He could not conceive of any country more rich in agricultural products than Sechuen. Wherever the slope was not more than 30°, the land was cultivated. Where it was steeper than that, a man could not stand to cultivate it. Rice was grown in the low valleys; higher up, Indian corn, which was probably the greatest crop in the country; and still higher up, wheat and barley. The people were very pleasant to travel amongst, and he never had an uncivil word from them during the whole time he was in China. There were four gold washings, but the river there ran through narrow gorges, so that it was almost impossible to do anything with it.

In conclusion, the PRESIDENT moved a cordial vote of thanks to Capt. Gill and Mr. Goad for their interesting papers.

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FRENCH GEOGRAPHICAL SOCIETY.

February 6th, 1878.—M. DE QUATREFAGES presiding. Lieutenant Wyse wrote from Chepo, under date the 20th December, to the effect that his party had arrived at Panama the 29th November, and had set about examining the Isthmus of San Blas, which is the narrowest between the Atlantic and Pacific Oceans, and which had been already explored more or less perfectly by Kelley (1864), by Wyse himself (1868), and Selfridge (1870-71). Lieutenant Wyse gave a detailed account of the examination of the Isthmus by himself and M. Reclus up to date.

M. le Comte MOUCHEZ brought to the notice of the Society a new instrument, of his own invention, for observing meridian altitudes: and M. B. PASQUIER gave a brief sketch of Afghanistan and its inhabitants. M. DE UJFALVY gave a very interesting recital of his last year's travels in Ferghanah and Kuldja, in which he dwelt on the devastation which the latter province has

sustained, in the massacre of the Chinese inhabitants by the Mussulmans.

February 20th, 1878.—M. DE QUATREFAGES presiding. M. W. Martin, Consul at Havre, communicated to the Society the latitude and longitude of Honolulu, as determined by the English expedition sent to observe there the transit of Venus. The co-ordinates were latitude 21° 17′ 56·8″ N., and longitude 157° 51′ 55″ E. of Greenwich.

Announcement was made of the sad death, at Zanzibar, of Messrs. Crespel and Maes, the Belgian explorers, who were starting for the interior, from the east coast of Africa. A discussion then took place with reference to a discovery of a *mappa mundi* of 1701, in the Lyons Library, on which the course of the Congo is shown very similarly to the course as drawn by Stanley. The award of the annual medals was then made known. The principal Gold Medal to Mr. Stanley for his journeys across Africa. A large Gold Medal to M. Vivien de Saint Martin, for his life-long labours in the cause of geography; and lastly, the Logerot Gold Medal (its first award), to Dr. Harmand, for the geographical results derived from his five journeys to the valley of the Mekong, and about the coast of Annam.

M. LEVASSEUR read the first part of a paper prepared by him, on the distribution of population over the globe, and began by tracing the history of territorial changes in France, ending with the losses sustained during the late war. The second part of the paper was reserved.

March 6th, 1878.—M. DE QUATREFAGES presiding. Dr. G. BARRION announced his departure for Cochin-China, and his intention of exploring various parts of Indo-China. General Morin despatched to the Society a collection of maps and atlases, sent by H.I.M. the Emperor of Brazil, for exhibition at the Philadelphia Exhibition. Mr. J. Jackson sent a hypsometrical map of the United States, drawn by M. H. Gannett, under the direction of Dr. Hayden. The contour lines are 1,000 feet apart, and the map is the most complete one of its kind in existence. Mr. Stanley acknowledged the receipt of the letter informing him of the award to him of the principal Gold Medal, and expressed his intention of visiting Paris in June. M. Deloncle, of Lyons, wrote to the effect that from documents in his hands, he had arrived at the conclusion that (1) Lake Tanganyika was not in existence at the time of the missionary journeys of the 14th, 15th, and 16th centuries; (2) that Unyamuezi, Ugogo, Uganda and other districts were known in the 14th century; (3) that Lakes Victoria and Albert Nyanza, Banguelo and Moero had been explored at the same time; (4) that the wide northern affluent of the Lualaba, discovered by Mr. Stanley, issues from the Albert Nyanza; (5) that Lake Nyanza was a basin, not perhaps as important as Mr. Cooley has made out, but much larger than now, and other minor points. The Geographical Society of Montpellier wrote to announce its foundation, Messrs. Germain and Paul de Ronville being President and Vice-President respectively. A letter was read from the French Consul at Zanzibar giving full particulars of the death of Messrs. Maes and Crespel, the Belgian travellers. A communication was read from M. A. Pinart, giving an account of Easter Island.

LYONS GEOGRAPHICAL SOCIETY.

January 31st, 1878.—Lieut.-Colonel DEBIZE, Vice-President, in the chair. In announcing Mr. Stanley's election as honorary member, the President recommended, and the Society approved of, the institution of Annual Medals in recognition of great geographical exploits. M. CH. ANDRE, Professor of Astronomy at the Faculté des Sciences, who had already, together with various naval officers, observed the transit of Venus, at Numea, gave an account of his arrangements for observing the transit of Mercury across the sun's disc, at Ogden in America. A letter was read from M. Largeau, promising to send a hydrographic and archæological map of the Sahara.

March 10th, 1878.—M. FRANÇOIS DELONCLE read a very complete paper on the sources of information used in the construction of the Lyons globe. Although the Capuchin friars laid down the basins of the Nile, the Congo, and the Zambesi, they erred in copying Ptolemy's theory of the interior lakes. Eduardo Lopez, in the narrative of his journey to the Congo (given by Pigafetta), describes the course of the Nile, its sources, tributaries, and lakes in the most circumstantial manner. The lecturer stated, however, that he had ascertained from unpublished documents that eight Dominicans left Montpellier in 1317 and ascended the Nile as far as Ugomba (?), that they then made for the Zambesi and discovered the town of Mani-Motapa, which they imagined to be the capital of "the great empire of Monomotapa." He was of opinion that the information derived from this journey had been embodied in the Lyons globe. The same authority represented two lakes within the basin of Lake Chad, between the parallels of 3° and 5° and 8° and 9° respectively, and the researches of Barth, Vogel, Overweg, and Fleuriot de Langre, he contended, favoured the correctness of this view.

The PRESIDENT announced, in conclusion, that M. Deloncle's valuable paper would be printed for general distribution.

March 17th, 1878.—Lieut.-Colonel DEBIZE presiding. M. LANÇON read a paper on the subject of Chinese immigration, and the prospect of China usurping the labour markets of the world.

BERLIN GEOGRAPHICAL SOCIETY.

January 5th, 1878.—Herr VON RICHTHOFEN in the chair. The PRESIDENT congratulated the Society on the fiftieth year of its existence. He referred to the establishment of a Geographical Society in Metz, under the presidency of Captain Yancke. The President also made mention of Lieutenant Gill's journey in Western China, remarking that the portion of his route between Atentze and Tali-fu is quite new.*

Dr. KARL SACHS, of Berlin, read a paper on his journey in Venezuela during the autumn of 1876. Herr BREHM spoke on the subject of settlers and exiles in Siberia, with particular reference to cultivation.

February 2nd, 1878.—Herr VON RICHTHOFEN in the chair. Announcement was made that Herr Schutt, an engineer, sent by the German African Society, had arrived at Loanda on the 10th December, and that he purposed to make his way to Kimbundo, with the object of making that a fixed point for further exploration. Freiherr Von Thielmann sent an account of a part of his journey in South America, from Paturia, on the River Magdalena to Bogota, and thence to Cartago, on the Cauca river. A number of height measurements were taken in the course of the journey, which will be published in Petermann's *Mittheilungen*. Herr ERMAN read a paper on the schemes for the construction of a ship-canal across Central America. Herr KERSTEN spoke on the subject of the scientific equipment and preparations necessary for explorers.

* Cooper succeeded in reaching Tung-lan, which is about half-way between Atentze and Tali-fu; and the Abbé Desgodins has given a detailed itinerary of a portion of the same route—*i.e.* as far as Tseko—in the *Bulletin de la Société de Geographie*, October 1875, p. 339.—(Ed. *G. M.*)

VIENNA GEOGRAPHICAL SOCIETY.

THE Annual Address of the President (Dr. Ferdinand von Hochstetter) is to be found in the January number of the *Mittheilungen* of the above Society. Mention was made of the Vienna branch of the International Association for the exploration of Central Africa, and of Herr Marno's appointment as explorer in connection with it. Reference was also made to Dr. Oscar Lenz's travels in the region of the Ogowai, and to the prospect of the early appearance of the account of Lieutenant Lux's journey from San Paolo de Loanda to Kimbundu. Dr. Emil Holub, whose travels in Southern Africa during the years 1873-77, formed the subject of an article in the September number of the *Mittheilungen* last year, was announced to be on his way homeward. Count Bela-Szechenyi, Messrs. G. Balinth and L. Loczy, and Lieutenant Kreuter intend after visiting India, Indo-China, Ceylon, the Sunda islands and Japan to repair to China, and to journey into Central Asia by way of Peking, principally with the object of studying the Kuen-Lun range.

Among important publications published during the year mention was made of the second volume of Herr Kanitz's work on Danubian Bulgaria and the Balkans, the fine work entitled *The Island of Réunion*, by Dr. Richard Ritter von Drasche, and the Wall Map of Africa, by Dr. Chavanne.

Dr. VON HOCHSTETTER gave a careful *résumé* of the labours of the Imperial Military Geographical Institute in its astronomical work, its triangulation, and levelling. With reference to the topographical work, he announced the completion of the drawing of thirty-six sheets of the map of Central Europe, on the scale of 1 : 300,000, including preliminary editions of Servia, Bosnia, Herzegovina, Montenegro, and six sheets of southern Turkey. Considerable progress had also been made with other cartographic productions. The labours of the Geological Survey were described at some length, and those of the Central Institute for Meteorology and Terrestrial Magnetism, the Austrian Meteorological Society, the Imperial Central Commission for Statistics, the Statistical Branch of the Department for Commerce, the Oriental Museum of Vienna, and other institutions were briefly adverted to.

During the year referred to forty-four new ordinary members and seven corresponding members were elected, raising the number of members to 641, corresponding members 132, and honorary members 70, after making allowance for deaths.

February 26th, 1878.—H. E. FREIHERR VON HOFMANN presiding. Herr Baron Greindl writes from Brussels, conveying the intelligence of the death of Messrs. Maes and Crespel at Zanzibar, and stating that Messrs. Marno and Cambier had set out on a journey into the interior. Herr Bela Gerster, engineer, read a paper on "The Project for Cutting a Canal through the Isthmus of Darien."

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ITALIAN GEOGRAPHICAL SOCIETY.

February 10th, 1878.—The Senator AMARI presiding. Signor GIACOMO BOVE, an officer of the Italian navy selected to accompany the Swedish Arctic Expedition of Professor Nordenskiold, read an able review of Arctic exploration in past times, with special reference to Professor Nordenskiold's approaching expedition into the Siberian Polar Sea. Signor Pigorini exhibited an ethnological collection from the Republic of Ecuador.

February 17th, 1878.—Il Commendatore GIORDANO, Vice-President, presiding. Signor CRISTOFORO NEGRI delivered a brief address, in continuation of Signor Bove's paper of the preceding meeting, on the subject of the prospects of Professor Nordenskiold's Arctic Expedition

HALLE GEOGRAPHICAL SOCIETY.

December 12th, 1877.—Dr. KIRCHHOFF presiding. Herr FUHST gave an account of the development and present state of the German Society for the Saving of Life from Shipwreck, an institution which has already rescued 1000 lives. Professor FREIHERR VON FRITSCH gave an account of his travels since 1866 in Santorin, through the Dardanelles, the Sea of Marmora, and the Bosphorus, to Mudania, Brussa, Isnik, and Ismid.

January 10th, 1878.—Dr. KIRCHHOFF presiding. Dr. GUSTAV NACHTIGAL read an interesting paper on the difficulties of African exploration, in which he explained the physical structure of the continent, and the various obstacles with which a traveller has to contend, according as he starts from the north, the east or west coast, in deserts, want of navigable rivers, the attacks of insects, the extraordinary force of the rains, and the hostility of natives. He expressed his doubt as to the expediency of the course of exploration followed by Stanley, and advocated the founding of stations, as favoured by the associations started under the auspices of the King of the Belgians.

February 13th, 1878.—Dr. KIRCHHOFF presiding. Dr. TRAUMULLER, of Leipsic, read a paper on "Java: its Topographical and Geological Features." The author had resided at Batavia between 1867-1870, and made many excursions into the interior. He ascended the volcanoes Gede and Panggerango, and visited the famous "Valley of Death." The carbonic acid gas which here accumulates to a height of 2 or 3 feet above the ground is noxious to small animals, but harmless to human beings. A former connection between Asia and Java appeared to the author to have once indubitably existed.

Dr. KIRCHHOFF took the opportunity to make a few observations on the ethnology and highly-flourishing condition of the island, which yields a net return of 200 millions of marks, and whose population has risen from 3½ millions at the beginning of the century to 18 millions in 1874.

March 13th, 1878.—Dr. KIRCHHOFF presiding. The PRESIDENT made mention of the newly-discovered petroleum springs in Rumania, and then delivered a brief address on the state of the Society and its progress during the past year. The total number of members amounted to 146. Dr. FRITSCH read a paper on the formation of the pelvis among different races. Dr. BRAUNS read a paper on the past condition of the Notte depression south of Berlin, as deduced from geological researches made there last summer.

NOTICE.

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